

**COPY**

IN THE UNITED STATES COURT OF APPEALS  
FOR THE ELEVENTH CIRCUIT

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No. 05-10341-II

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Cobb County School District, et al.,  
Defendants/Appellants

v.

Jeffrey Michael Selman, et al.,  
Plaintiffs/Appellees,

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**BRIEF OF AMICI CURIAE BIOLOGISTS AND OTHER  
SCIENTISTS IN SUPPORT OF APPELLANTS**

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**CERTIFICATE OF INTERESTED PERSONS AND  
CORPORATE DISCLOSURE STATEMENT**

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Undersigned counsel of record for Amici Curiae Biologists and other Scientists hereby certifies that the following persons and entities have an interest in the outcome of this case:

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Honorable J. Foy Guin, Jr.

Kansas Citizens for Science

Michigan Citizens for Science

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**Trial Judge:**

Honorable Clarence Cooper

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## **STATEMENT OF ISSUES**

1. Are there legitimate scientific issues as to whether life arose and developed by means of chemical and biological evolution?
2. May the legitimate scientific issues concerning chemical and biological evolution be discussed in the public school classroom without endorsing a religion?

## **INTRODUCTION**

Amici curiae are scientists and include a number of biologists. Most of them live in the Eleventh Circuit's jurisdiction. Each of the individual signatories to the brief has earned a science-related doctoral degree. Amici include university professors, research scientists and scientists in private industry. All amici question biological or neo-Darwinian evolutionary theory (the modern Darwinian theory of evolution) from a scientific perspective, as well as evolutionary accounts of the chemical origin of the first life on Earth. That is to say, amici are scientists who are skeptical of the ability of random mutations and natural selection to account for the origin and complexity of life.

## **INTEREST OF AMICI CURIAE**

Amici are professional scientists who seek to inform the Court that there is a live and growing scientific controversy surrounding neo-Darwinian theory. This

controversy, which is implicated in this case, is the subject of serious academic debate. Amici also seek to highlight the scientific controversy over whether chemical evolutionary theory can adequately explain the origin of the first life on Earth. Finally, Amici assert that the science education necessary to equip students for the 21<sup>st</sup> Century should not censor relevant scientific information about important scientific controversies (such as neo-Darwinian and chemical evolutionary theories), but should fully inform students about such scientific debates.

### **COMPLETE LIST OF AMICI CURIAE**

#### **Biologists**

Raymond G. Bohlin, Ph.D. Molecular and Cell Biology (University of Texas at Dallas);

Yvonne Boldt, Ph.D. Microbiology (University of Minnesota);

William S. Harris, Ph.D. Nutritional Biochemistry (University of Minnesota),  
Professor of Medicine, University of Missouri-Kansas City School of Medicine;

Cornelius Hunter, Ph.D. Biophysics and Computational Biology (Illinois University);

Dean Kenyon, Ph.D. Biophysics (Stanford University), Professor Emeritus of  
Biology, San Francisco State University;

Scott Minnich, Ph.D. Microbiology (Iowa State University), Associate Professor of  
Microbiology, University of Idaho;

Ralph Seelke, Ph.D. Microbiology (University of Minnesota); Professor of Microbiology, University of Wisconsin-Superior.

Chris Williams, Ph.D. Biochemistry (The Ohio State University);

### **Other Scientists**

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Changhyuk An, Ph.D. Physics (University of Tennessee);

Eugene C. Ashby, Ph.D. Chemistry (Notre Dame University), Emeritus Regents Professor and Distinguished Professor, School of Chemistry and Biochemistry, Georgia Institute of Technology;

Phillip Bishop, Ed.D. Exercise Physiology (University of Georgia), Professor of Kinesiology, University of Alabama;

John H. Bordelon, Ph.D. Electrical Engineering (Georgia Institute of Technology), Senior Research Engineer, School of Electrical & Computer Engineering, Georgia Institute of Technology;

Noel Ricky Byrn, Ph. D. Nuclear Engineering (Georgia Institute of Technology);

Nancy Bryson, Ph.D. Chemistry (University of South Carolina), Assistant Professor of Chemistry, Kennesaw State University;

A. Eugene Carden, Ph.D. Metallurgy (University of Connecticut), Professor Emeritus of Engineering Mechanics, University of Alabama;

Russell W. Carlson, Ph.D. Biochemistry (University of Colorado, Boulder), Professor of Biochemistry & Molecular Biology, Technical Director of the Complex Carbohydrate Research Center, University of Georgia;

Leon L. Combs, Ph.D. Chemical Physics (Louisiana State University), Professor and Chair, Department of Chemistry and Biochemistry, Kennesaw State University;

Michael Covington, Ph.D. Linguistics (Yale University), Associate Director, Artificial Intelligence Center, University of Georgia;

Malcolm A. Cutchins, Ph.D. Engineering Mechanics (Virginia Polytechnic Institute and State University), Emeritus Professor of Aerospace Engineering, Auburn University;

Cham E. Dallas, Ph.D. Toxicology (University of Texas, Austin), Professor and Director, CDC Center for Mass Destruction Defense, University of Georgia and Medical College of Georgia;

S. Todd Deal, Ph. D. BioOrganic Chemistry (The Ohio State University), Professor of Chemistry, Georgia Southern University;

Keith S. Delaplane, Ph.D. Entomology (Louisiana State University), Professor of Entomology, University of Georgia;

Allison J. Dobson, Ph.D. Physical Chemistry (The Ohio State University), Associate Professor of Chemistry, Georgia Southern University;

John M Ford, Ph.D. Physics (Virginia Polytechnic Institute and State University);

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Dewey H. Hodges, Ph.D. Aeronautical & Astronautical Engineering (Stanford University), Professor, Aerospace Engineering, Georgia Institute of Technology;

Timothy Hoover, Ph.D. Biochemistry (University of Wisconsin), Associate Professor and Associate Head of Microbiology, University of Georgia;

Richard J. Kinch, Ph.D. Electrical Engineering and Computer Science (Cornell University);

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Joseph M. Lary, Ph.D. Biology (University of Alabama);

George Lebo, Ph.D. Physics (University of Florida), Emeritus Associate Professor Astronomy, University of Florida;

Roger J. Lien, Ph.D. Physiology (North Carolina State University), Associate Professor, Poultry Science Department, Auburn University;

Emerson Thomas McMullen, Ph.D. History & Philosophy of Science (Indiana University), Associate Professor of History, Georgia Southern University;

Henry F. Schaefer, Ph.D. Chemical Physics (Stanford University), Graham Perdue Professor of Chemistry and Director of the Center for Computational Chemistry, University of Georgia;

Norman E. Schmidt, Ph.D. Chemistry (University of South Carolina), Professor of Chemistry, Georgia Southern University;

Robert B. Sheldon, Ph.D. Physics (University of Maryland, College Park);

Michael A. Skinner, M.D. (Rush College of Medicine), Associate Professor of Surgery, Duke University;

William C. Small, M.D., Ph.D., Physical Chemistry (Emory University), Associate Professor of Radiology, Emory University;

Darwin W. Smith, Ph.D., Chemistry (California Institute of Technology), Emeritus Professor of Chemistry, University of Georgia;

Daniel W. Tedder, Ph.D. Chemical Engineering (University of Wisconsin), Associate Professor, School of Chemical and Biomolecular Engineering, Georgia Institute of Technology;

Charles B. Thaxton, Ph.D. Physical Chemistry (Iowa State University), co-author, *The Mystery of Life's Origin: Reassessing Current Theories* (1984);

James A. Tumlin, M.D. (Emory University), Associate Professor of Medicine, Emory University;

William E. Wade, Pharm.D., (University of Georgia), Professor of Pharmacy, College of Pharmacy, University of Georgia;

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John W. Worley, Ph.D. Agricultural Engineering (Virginia Polytechnic Institute and State University), Associate Professor, Department of Biological and Agricultural Engineering, University of Georgia.

### **SUMMARY OF ARGUMENT**

Amici scientists wish to bring to the Court's attention the current debate within scientific disciplines over whether chemical and biological (i.e., neo-Darwinian) evolution can adequately account for the origin of life and the development of life into its current forms. This debate is scientific and not religious in nature.

In order for public school students to receive an adequate scientific education, they should be acquainted with the debate over chemical and neo-Darwinian evolution. This debate can be discussed without practicing religion or even referring to religion. Amici contend that the sticker placed by the Cobb County School Board sticker in certain science textbooks, to the extent it

encourages students to think critically and grapple with the scientific debate, is not unconstitutional. Importantly, the sticker does not even endorse or mention religion.

### **ARGUMENT AND CITATIONS OF AUTHORITY**

Scientific discoveries of the last few decades have led to greater skepticism over the ability of the mechanisms of biological or neo-Darwinian evolutionary theory to account for the complexity of life we see today. Amici represent a sampling of the growing number of scientists who are skeptical of neo-Darwinism's claim that the undirected mechanisms of natural selection and random genetic variations can account for the complexity of life. Amici also represent a number of scientists who are skeptical of chemical evolutionary theory's ability to account for the origin of life.

As the district court recognized, that there are scientists who continue to raise scientific challenges to neo-Darwinian and chemical evolutionary theories.<sup>1</sup> Amici are doctoral scientists who are skeptical of neo-Darwinian theory and chemical evolutionary theory on scientific grounds. Neo-Darwinian theory is being re-examined by scientists in light of new scientific discoveries. Scientific discoveries of the past few years and the increasing body of scientific knowledge

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<sup>1</sup>(R4-98-33) (“there are some scientists who have questions regarding certain aspects of evolutionary theory”).

available today makes the claims of neo-Darwinian theory far less tenable than in the early part of the 20<sup>th</sup> Century. One biochemist has gone so far as to describe neo-Darwinian theory as “a theory in crisis.”<sup>2</sup> An increasing number of scientific publications directly challenge neo-Darwinian theory, or key aspects of it.<sup>3</sup> Recent discoveries have also led to greater challenges for traditional chemical evolutionary scenarios for the origin of the first life from non-life.

Neo-Darwinian theory presently remains the dominant theory of origins in the scientific community, but serious debate now exists about its sufficiency.

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<sup>2</sup>Michael J. Denton, Evolution: A Theory in Crisis (1986).

<sup>3</sup>See, e.g., Michael J. Behe and David W. Snoke, *Simulating Evolution by Gene Duplication of Protein Features that Require Multiple Amino Acid Residues*, 13 Protein Science 2651 (October, 2004); Michael J. Behe, *Irreducible Complexity: Obstacle to Darwinian Evolution*, in William A. Dembski and Michael Ruse, eds., Debating Design: From Darwin to DNA 352 (2004); Michael J. Behe, *Self-Organization and Irreducibly Complex Systems: A Response to Shanks and Joplin*, 67 Philosophy of Science 155-62 (March, 2000); Michael J. Behe, Darwin's Black Box: The Biochemical Challenge to Evolution (1996); William A. Dembski, No Free Lunch: Why Specified Complexity Cannot be Purchased Without Intelligence (2002); Michael J. Denton, Nature's Destiny (1998); Michael J. Denton, Evolution: A Theory in Crisis; Stephen C. Meyer, *The Origin of Biological Information and the Higher Taxonomic Categories*, 117 [no. 2] Proceedings of the Biological Society of Washington 213-239 (2004); Stephen C. Meyer, Marcus Ross, Paul Nelson, and Paul Chien, *The Cambrian Explosion: Biology's Big Bang*, in John Angus Campbell and Stephen C. Meyer, eds., Darwin, Design and Public Education 323 (2003); Scott A. Minnich and Stephen C. Meyer, *Genetic Analysis of Coordinate Flagellar And Type III Regulatory Circuits in Pathogenic Bacteria*, Second International Conference on Design & Nature (2004); Jeffrey H. Schwartz, Sudden Origins: Fossils, Genes and the Emergence of Species (1999).



Although amici represent a minority position within the scientific community, dissenting viewpoints have always been an integral part of the scientific process. Scientists debate over how best to interpret data. When such debates are raging, students need to know about them.

In addition to amici and other scientists who are skeptical of neo-Darwinian theory, there are many scientists who still accept the theory but acknowledge some of its difficulties. Many such scientists have pointed to scientific problems surrounding aspects of neo-Darwinian theory.<sup>4</sup>

There are two main parts of neo-Darwinian evolutionary theory: universal common descent and the power of natural selection. Scientific publications highlight neo-Darwinian theory's problems related to pattern; i.e. the large-scale geometry of biological history.<sup>5</sup> Questions remain as to how organisms are related

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<sup>4</sup>See, e.g., selected essays in Gerd B. Müller and Stuart A. Newman, eds., Origination of Organismal Form: Beyond the Gene in Developmental and Evolutionary Biology (2003); James W. Valentine, On the Origin of Phyla 189-194 (2004).

<sup>5</sup>See, e.g., Michael S. Y. Lee, *Molecular Clock Calibrations and Metazoan Divergence Dates*, 49 Journal of Molecular Evolution 385 (1999); Michael S. Y. Lee, *Molecular Phylogenies Become Functional*, 14 Trends in Ecology and Evolution 177-178 (1999); Simon Conway Morris, *Evolution: Bringing Molecules into the Fold*, 100 Cell 1 (2000); Simon Conway Morris, *The Cambrian 'Explosion' of Metazoans*, in Origination of Organismal Form 13 (2003); Simon Conway Morris, *The Question of Metazoan Monophyly and the Fossil Record*, 21 Progress in Molecular and Subcellular Biology 1 (2003); Simon Conway Morris, *Cambrian 'Explosion' of Metazoans and Molecular Biology: Would Darwin be*

to one another and how we can detect such relationships. An increasing number of scientists have raised questions about whether there is sufficient evidence for universal common descent.

Other scientific publications underscore Darwinian theory's difficulties concerning process; i.e., the mechanisms of evolution.<sup>6</sup> Questions persist as to

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*Satisfied?*, 47 (7-8) International Journal of Developmental Biology 505 (2003); James W. Valentine, & D. Jablonski, *Morphological and developmental macroevolution: a paleontological perspective*, 47 International Journal of Developmental Biology 517-522 (2003); P. Willmer, *Convergence and Homoplasy in the Evolution of Organismal Form*, in Origination of Organismal Form 33-50 (2003); P. Willmer, Invertebrate Relationships: Patterns in Animal Evolution (1990); Carl Woese, *The Universal Ancestor*, 95 Proceedings of the National Academy of Sciences USA 6854-6859 (1998).

<sup>6</sup>See, e.g., H. Becker & W. Lonngig, *Transposons: Eukaryotic*, in 18 Nature Encyclopedia of Life Sciences, 529 (2001); Michael J. Behe and David W. Snoke, *Simulating Evolution by Gene Duplication of Protein Features that Require Multiple Amino Acid Residues*, 13 Protein Science 2651 (October, 2004); R. L. Carroll, *Towards a New Evolutionary Synthesis*, 15 Trends in Ecology and Evolution 27-32 (2000); D. H. Erwin, *Early Introduction of Major Morphological Innovations*, 38 Acta Palaeontologica Polonica 281 (1994); S.F. Gilbert, et al., *Resynthesizing Evolutionary and Developmental Biology*, 173 Developmental Biology 357 (1996); B. C. Goodwin, *What are the Causes of Morphogenesis?* 3 BioEssays 32-36 (1985); W. E. Lonngig & H. Saedler, *Chromosome Rearrangements and Transposable Elements*, 36 Annual Review of Genetics 389 (2002); Simon Conway Morris, *Evolution: Bringing Molecules into the Fold*, 100 Cell 1 (2000); Simon Conway Morris, *Cambrian "Explosion" of Metazoans and Molecular Biology: Would Darwin Be Satisfied?*, 47 [7-8] International Journal of Developmental Biology 505 (2003); Olivier Rieppel, *Turtles as Hopeful Monsters*, 23 BioEssays 987-91 (2001); N. H. Shubin & C. R. Marshall, *Fossils, Genes and the Origin of Novelty*, in Deep Time 324 (2000); B. M. Stadler, et. al, *The Topology of the Possible: Formal Spaces Underlying Patterns of Evolutionary Change*, 213 Journal of Theoretical Biology 241 (2001); K. S. Thomson,

whether microevolutionary processes can be extrapolated to prove macroevolutionary change. Still other scientific publications call into question the ability of neo-Darwinian mechanisms to generate novel genetic information, novel organs, structures and body plans.

In addition, many scientific publications have questioned whether chemical evolutionary theory can explain the origin of the first life from non-living chemicals (the “origin-of-life” problem).<sup>7</sup>

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*Macroevolution: The Morphological Problem*, 32 American Zoologist 106 (1992); James W. Valentine, On the Origin of Phyla 189-94 (2004); G. P. Wagner & P.F. Stadler, *Quasi-Independence, Homology and the Unity-C of Type: A Topological Theory of Characters*, 220 Journal of Theoretical Biology 505 (2003); G. Webster & B. Goodwin, Form and Transformation: Generative and Relational Principles in Biology (1996).

For discussion of many of the above references, see Stephen C. Meyer, Stephen C. Meyer, *The Origin of Biological Information and the Higher Taxonomic Categories*, 117 [no. 2] Proceedings of the Biological Society of Washington 213 (2004).

<sup>7</sup>See, e.g., Simon Conway Morris, Life’s Solution: Inevitable Humans in a Lonely Universe 22-43, and esp. 44-68 (2003); Paul Davies, The Fifth Miracle: The Search for the Origin and Meaning of Life (2000); Leslie E. Orgel, *The Origin of Life—A Review of Facts and Speculations*, 23 Trends in Biochemical Science 491-95 (1998); Antonio Lazcano & Stanley Miller, *The Origin and Early Evolution of Life: Prebiotic Chemistry, the Pre-RNA World, and Time*, 85 Cell 793 (1996); Hubert Yockey, Information Theory and Molecular Biology, esp. 259-293 (1992); Robert Shapiro, Origins: A Skeptic’s Guide to the Creation of Life on Earth, esp. 132-154 (1986); Robert Shapiro, *Prebiotic Ribose Synthesis: A Critical Analysis*, 18 Origins of Life & Evolution Biosphere 71, 71-85 (1988).

Also see Walter Bradley, *Information, Entropy and the Origin of Life*, in Debating Design 331 (2004); Stephen C. Meyer, *DNA and the Origin of Life: Information, Specification and Explanation*, in Darwinism, Design and Public

Amici emphasize that standard high school and college biology textbooks routinely ignore scientific data challenging neo-Darwinian and chemical evolutionary theories, as well as scientific data that merely point to widely-acknowledged scientific problems confronting those theories.

Furthermore, many textbooks contain alleged evidences for neo-Darwinian theory that have long been discredited by scientists, including neo-Darwinists.<sup>8</sup> Amici assert that school boards should be able to take reasonable steps to ensure that students are fully-informed about the scientific controversy surrounding Darwin's theory and that their curriculum is free from factual errors, including

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Education 223 (2003); Charles B. Thaxton, et al., The Mystery of Life's Origin: Reassessing Current Theories (1984).

<sup>8</sup>See, e.g., Jerry Coyne, *Not Black and White*, 396 Nature 35-36 (1998); Stephen Jay Gould, *Abscheulich! (Atrocious!)*, Natural History 42-49 (March, 2000); Judith Hooper, Of Moths & Men: An Evolutionary Tale: The Untold Story of Science and the Peppered Moth (2002); Craig Millar & David Lambert, *Industrial Melanism—A Classic Example of Another Kind?*, 49 BioScience 1021-23 (1999); Elizabeth Pennisi, *Haeckel's Embryos: Fraud Rediscovered*, 277 Science 1435 (1997); Michael Richardson, et al., *There is No Highly Conserved Embryonic Stage in the Vertebrates: Implications for Current Theories of Evolution and Development*, 196 Anatomy & Embryology 91 (1997); Theodore D. Sargent, Craig D. Millar & David Lambert, *The 'Classical' Explanation of Industrial Melanism: Assessing the Evidence*, 30 Evolutionary Biology 299 (1998); Jonathan Wells, *Haeckel's Embryos & Evolution: Setting the Record Straight*, American Biology Teacher 345-49 (May, 1999); Jonathan Wells, *Second Thoughts About Peppered Moths*, 11 Scientist 11 (May 24, 1999).

Also see Jonathan Wells, Icons of Evolution: Science or Myth?: Why Much of What We Teach About Evolution is Wrong (2000).

those that overstate the case for neo-Darwinian theory and chemical evolutionary theory.

In some instances, it is likely that metaphysical preferences and presuppositions of some scientists have prevented students from learning about scientific challenges to neo-Darwinian and chemical evolutionary theories or prevented the correction of textbook errors that overstate the case for neo-Darwinian and chemical evolutionary theories.

The lack of public science classroom coverage given to the growing scientific controversy surrounding neo-Darwinian evolutionary theory and frequent inclusion of erroneous information about the subject in textbooks (without any corrective counter-balances) present a dilemma for many school board members, administrators and educators who wish to teach neo-Darwinian and chemical evolutionary theories—but also wish to do so in the fairest and most accurate manner possible.

Amici fully support the United States Supreme Court's recognition of the power of states and local school boards to permit teachers and students to discuss scientific critiques of prevailing scientific theories. Regardless of this Court's ultimate determination of the constitutional status of the textbook sticker at

issue<sup>9</sup>—and in light of the controversy over neo-Darwinism, the controversy over the chemical origin of life, and importance of critical thinking skills as a part of good science education—Amici urge the Court to be mindful of the importance of academic freedom in public school classrooms and the essential role of dissenting scientific viewpoints to the scientific enterprise.

### CONCLUSION

For the foregoing reasons, amici curiae urge the Court to reverse the decision of the district court and uphold the constitutionality of the textbook sticker.

Respectfully submitted,



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<sup>9</sup>The sticker states:

This textbook contains material on evolution. Evolution is a theory, not a fact, regarding the origin of living things. This material should be approached with an open mind, studied carefully, and critically considered.

(R4-98-8).

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## **CERTIFICATE OF COMPLIANCE**

Counsel certifies that this brief complies with the type-volume limitation set forth in FRAP 29(d), 32(a)(7)(B). According to the word-processing system used to prepare it, this brief contains 1,955 words.



IN THE UNITED STATES COURT OF APPEALS  
FOR THE ELEVENTH CIRCUIT

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No. 05-10341-II

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Cobb County School District, et al.,  
Defendants/Appellants

v.

Jeffrey Michael Selman, et al.,  
Plaintiffs/Appellees,

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**CERTIFICATE OF SERVICE**

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I hereby certify that I have this date served a copy of the foregoing upon the parties by mailing copies, with sufficient postage attached, to:

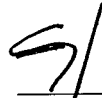
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