

## Curriculum Vitae

### John David Clements

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#### Education

- 1979 Ph.D., University of Texas Health Science Center at Dallas. Graduate School of Biomedical Science, Dallas, Texas.  
Major: Microbiology. Dissertation: Isolation and characterization of homogeneous heat-labile enterotoxin (LT) with high specific activity from *Escherichia coli* cultures.
- 1974 B.S., University of Texas at Arlington, Arlington, Texas.  
Major: Microbiology; Minor: Chemistry.

#### Professional Experience

- 2018- Professor Emeritus, Department of Microbiology and Immunology, Tulane University School of Medicine, New Orleans, LA
- 2009-2014 Director, Tulane University Center for Infectious Diseases, New Orleans, LA
- 2007-2012 Co-Director, South Louisiana Institute for Infectious Disease Research
- 2007-2012 Co-Director, Louisiana Vaccine Center
- 2006-2009 Vice Dean for Research, Tulane University School of Medicine, New Orleans, LA
- 1999-2018 Professor and Chair, Department of Microbiology and Immunology, Director, Program in Molecular Pathogenesis and Immunity, Tulane University School of Medicine, New Orleans, LA
- 1998-1999 Professor and Interim Chair, Department of Microbiology and Immunology, Tulane University School of Medicine, New Orleans, LA
- 1992-1998 Professor of Microbiology and Immunology, Tulane University School of Medicine, New Orleans, LA.
- 1993-1994 Acting Vice Dean for Academic Affairs, Tulane University School of Medicine, New Orleans, LA.
- 1984-1992 Associate Professor of Microbiology and Immunology, Tulane University School of Medicine, New Orleans, LA.
- 1982-1984 Assistant Professor of Microbiology and Immunology, Tulane University School of Medicine, New Orleans, LA.
- 1980-1982 Assistant Professor of Medicine and Assistant Professor of Microbiology, University of Rochester School of Medicine and Dentistry, Rochester, N.Y.
- 1979-1980 National Research Council Associate, Walter Reed Army Institute of Research, Washington, D.C.
- 1975-1979 Graduate Student, Department of Microbiology, University of Texas Health Science Center, Dallas, Texas.

## Professional Service

- 2020- Co-Chair, National Research Council Committee on Army Medical Research and Development Infrastructure Planning.
- 2020 Special Reviewer, Bacteriology and Mycology-1 Study Section, National Institutes of Health, National Institute of Allergy and Infectious Diseases.
- 2020 Reviewer, Special Emphasis Panel ZAI1 MMF-X-S2 to PAR-20-177 and PAR-20-178, "Emergency Awards: Rapid Investigation of Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) and Coronavirus Disease 2019 (COVID-19) (R21/R01 Clinical Trial Not Allowed)," National Institutes of Health, National Institute of Allergy and Infectious Diseases.
- 2020 Reviewer, Special Emphasis Panel ZAI1 MMF-X-S3 to PAR-20-177 and PAR-20-178, "Emergency Awards: Rapid Investigation of Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) and Coronavirus Disease 2019 (COVID-19) (R21/R01 Clinical Trial Not Allowed)," National Institutes of Health, National Institute of Allergy and Infectious Diseases.
- 2020 Member Defense Health Board Public Health Subcommittee
- 2018 Scientific Advisory Panel, International Conference on Vaccines against *Shigella* and ETEC, Mexico City, Mexico
- 2017 Member, National Academy of Sciences Committee on Strategies for Cost-effective and Flexible Biological Detection Systems. Washington, D.C.
- 2017 Scientific Advisory Panel, International Conference on Vaccines for Enteric Diseases, Albufeira, Portugal
- 2015 Scientific Advisory Panel, International Conference on Vaccines for Enteric Diseases, Edinburgh, UK
- 2013 Chair, National Academy of Sciences international workshop on Science Needs for Microbial Forensics: Developing an Initial International Roadmap in Zagreb, Croatia
- 2013 Chair, National Academy of Sciences Educational Institute of Responsible Science, Kuala Lumpur, Malaysia
- 2013-2017 Member Defense Health Board Public Health Subcommittee
- 2013 Scientific Advisory Panel, International Conference on Vaccines for Enteric Diseases, Bangkok, Thailand
- 2012 Chair, National Academy of Sciences Education Institute for Responsible Research on Infectious Diseases, Aqaba, Jordan
- 2011-2013 National Academy of Sciences committee on developing a framework for an international faculty development project on education about research in the life sciences with dual use potential, Washington, DC.
- 2012 Scientific Advisory Panel, International Conference on Modern Vaccine Adjuvant and Delivery Systems, Copenhagen, Denmark
- 2011 Scientific Advisory Panel, International Conference on Vaccines for Enteric Diseases, Cannes, France

2010-2012 National Vaccine Advisory Committee (NVAC) H1N1 Vaccine Safety Risk Assessment Working Group (VSRAWG)

2010 Scientific Advisory Panel, International Conference on Modern Mucosal Vaccines, Adjuvants, and Microbicides, Dublin, Ireland

2009 National Academy of Sciences committee on biosafety and personnel reliability in laboratories that conduct research of biological select agents and toxins, Washington, DC.

2009 Scientific Advisory Panel, International Conference on Modern Vaccine Adjuvant and Delivery Systems, Vienna, Austria

2009 Scientific Advisory Panel, International Conference on Vaccines for Enteric Diseases, Malaga, Spain

2007-2017 Scientific Advisory Board, PATH Enteric Vaccine Initiative

2007-2015 Scientific Advisory Board, Western Regional Center of Excellence for Biodefense Research

2007-2010 Member Defense Health Board

2007 Scientific Advisory Panel, International Conference on Vaccines for Enteric Diseases, Lisbon, Portugal.

2006-2007 Member Armed Forces Epidemiological Board

2005 Scientific Advisory Panel, International Conference on Plant-Based Vaccine/Antibodies, Prague, Czech Republic.

2004 Member of the Iraq Survey Group, Department of Defense, Baghdad, Iraq.

2004 Scientific Advisory Panel, Mérieux Foundation international symposium on Plant-Derived Vaccine and Antibodies: Potential and Limitations, Annecy France.

2004 Scientific Advisory Panel, Mérieux Foundation international symposium on Innate and Adaptive Immunity After Transcutaneous and Mucosal Vaccinations, Annecy, France

2004 Scientific Advisory Panel, International Conference on Vaccines for Enteric Diseases, Montego Bay, Jamaica.

2003 Member of the Iraq Survey Group, Department of Defense, Baghdad, Iraq.

2003 United Nations Monitoring, Verification and Inspection Commission (UNMOVIC) training program.

2002 Chair, Executive Review Committee, Military Infectious Diseases Research Programs

2001 Organizer, International Conference on Vaccines for Enteric Diseases, Tampere, Finland.

2000 American Society for Microbiology Foundation Lecturer.

2000 Special Reviewer, Bacteriology and Mycology-1 Study Section, National Institutes of Health, National Institute of Allergy and Infectious Diseases.

2000 Chair, Special Review Panel, AITC Immunology Training Grants, ZAI1-GLM-I-M2, National Institutes of Health, National Institute of Allergy and Infectious Diseases.

2000 Reviewer, Military Infectious Diseases Research Program (MIDRP)

1999-2005 Editor, Infection and Immunity.

1999 Chair, Special Review Committee for RFA AI-98-009 "International Collaborations in Infectious Disease Research (ICIDR)", National Institutes of Health, National Institute of Allergy and Infectious Diseases.

- 1998 Chair, Special Review Committee for PAR-NIH-NIAID-DAIDS-98-007 "Innovation Grant Program for Approaches in HIV Vaccine Research", National Institutes of Health, National Institute of Allergy and Infectious Diseases.
- 1998 Consultant to WHO on Evaluation of Vaccines Administered via Mucosal Surfaces.
- 1996 Special Reviewer, Bacteriology and Mycology-1 Study Section, National Institutes of Health, National Institute of Allergy and Infectious Diseases.
- 1996 Primary Reviewer, The Journal of Immunology.
- 1994 Editorial Review Panel, Certified Medical Representatives Institute.
- 1994 Special Reviewer, Bacteriology and Mycology-1 Study Section, National Institutes of Health, National Institute of Allergy and Infectious Diseases.
- 1993-1999 Editorial Board, Infection and Immunity.
- 1993 Chair, Special Review Committee for RFA AI-93-05 "International Collaborations in Infectious Disease Research (ICIDR)", National Institutes of Health, National Institute of Allergy and Infectious Diseases.
- 1993 Special Reviewer, Bacteriology and Mycology-1 Study Section, National Institutes of Health, National Institute of Allergy and Infectious Diseases.
- 1992 Consultant, Review Panel on Typhoid Vaccines, Food and Drug Administration.
- 1992 Special Reviewer, Special Review Committee for RFA AI-92-02 "Enhancing Vaccine Immunogenicity", National Institutes of Health, National Institute of Allergy and Infectious Diseases.
- 1992 Special Reviewer, Bacteriology and Mycology-1 Study Section, National Institutes of Health, National Institute of Allergy and Infectious Diseases.
- 1988 Advisor to WHO on Development of Vaccines for Cholera and ETEC Diarrhea.
- 1988 Special Reviewer, Bacteriology and Mycology-1 Study Section, National Institutes of Health, National Institute of Allergy and Infectious Diseases.
- 1985-92 Secretary, Division B (Microbial Pathogenesis), American Society for Microbiology.
- 1985 Latin American Visiting Professor, American Society for Microbiology. Host Institute: National Institute of Hygiene, Montevideo, Uruguay.
- 1982-88 Editorial Board, Infection and Immunity.

### **Military Service**

- 1966-72 United States Marine Corps.
- 1972-91 United States Marine Corps Reserve.  
Rank: Lieutenant Colonel.

Awards and Decorations: Vietnamese Campaign Ribbon, Vietnamese Service Medal, Vietnamese Cross of Gallantry, National Defense Service Medal, Organized Marine Corps Reserve Medal, Good Conduct Medal, Combat Action Ribbon, Navy Unit Citation, Presidential Unit Citation, Navy Achievement Medal, Navy Commendation Medal.

### **Publications**

- Nelson, E.T., J.D. Clements, and R.A. Finkelstein. 1976. *Vibrio cholerae* adherence and colonization in experimental cholera: electron microscopic studies. Infect. Immun. 14: 527-547.

- Finkelstein, R.A., M. Arita, J.D. Clements, and E.T. Nelson. 1978. Isolation and purification of an adhesive factor ("*Cholera lectin*") from *Vibrio cholerae*. In Proc. 13th Joint U.S. Japan Conference on Cholera, Atlanta, Ga., Sept. 19-21, 1977. p. p. 137-151.
- Clements, J.D., and R.A. Finkelstein. 1978. Immunological cross- reactivity between a heat-labile enterotoxin(s) of *Escherichia coli* and subunits of *Vibrio cholerae* enterotoxin. Infect. Immun. 21: 1036-1039.
- Clements, J.D., and R.A. Finkelstein. 1978. Demonstration of shared and unique immunological determinants in enterotoxins from *Vibrio cholerae* and *Escherichia coli*. Infect. Immun. 22: 709-713.
- Clements, J.D., and R.A. Finkelstein. 1979. Isolation and characterization of homogeneous heat-labile enterotoxins with high specific activity from *Escherichia coli* cultures. Infect. Immun. 24: 760-769.
- Alving, C.R., B. Banerji, J.D. Clements, and R.L. Richards. 1980. Adjuvanticity of lipid A and lipid A fractions in liposomes. In B.H. Tom and H.R. Six (ed.), Liposomes and Immunology. Elsevier/North Holland Publishing Co., N.Y. p.p. 67-68.
- Alving, C.R., B. Banerji, T. Shiba, S. Kotani, J.D. Clements, and R.L. Richards. 1980. Liposomes as vehicles for vaccines. In A. Mizradhi (ed.), New Developments in Human and Veterinary Vaccines. Proc. of the 25th Oholo Conference, Zichron Yaacov, Israel, 24-27 March, 1980. Alan R. Liss, Inc. N.Y. (In their series "Progress in Clinical and Biological Research.") pp. 339-356.
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- Gill, D.M., J.D. Clements, D.C. Robertson, and R.A. Finkelstein. 1981. Subunit number and arrangement in *Escherichia coli* heat-labile enterotoxin. Infect. Immun. 33: 677-682.
- Klipstein, F.A., R.F. Engert, and J.D. Clements. 1981. Protection in rats immunized with *Escherichia coli* heat-stable enterotoxin. Infect. Immun. 34: 637-639.
- Klipstein, F.A., R.F. Engert, and J.D. Clements. 1982. Development of a vaccine of cross-linked heat-stable and heat-labile enterotoxins that protects against *Escherichia coli* producing either enterotoxin. Infect. Immun. 37: 550-557.
- Clements, J.D., R.J. Yancey and R.A. Finkelstein. 1982. Characterization of the heat-labile enterotoxin of *Escherichia coli*. In J.B. Robbins, J.C. Hill, and J.C. Sadoff (ed.), Seminars in Infectious Diseases. Volume IV: Bacterial Vaccines. Thieme-Stratton, Inc., N.Y. pp. 54-63.
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- Clements, J.D., D.C. Flint, and F.A. Klipstein. 1982. Immunological and physicochemical characterization of heat-labile enterotoxins isolated from two strains of *Escherichia coli*. Infect. Immun. 38: 806-809.
- Klipstein, F.A., R.F. Engert, J.D. Clements, and R.A. Houghten. 1983. Vaccine for enterotoxigenic *Escherichia coli* based on synthetic heat-stable toxin cross-linked to the B subunit of heat-labile toxin. J. Infect. Dis. 147: 318-326.

- Clements, J.D., D.C. Flint, R.F. Engert, and F.A. Klipstein. 1983. Cloning and molecular characterization of the B subunit of *Escherichia coli* heat-labile enterotoxin. *Infect. Immun.* 40: 653-658.
- Klipstein, F.A., R.F. Engert, J.D. Clements, and R.A. Houghten. 1983. Protection against human and porcine enterotoxigenic strains of *Escherichia coli* in rats immunized with a cross-linked toxoid vaccine. *Infect. Immun.* 40: 924-929.
- Klipstein, F.A., R.F. Engert, J.D. Clements, and R.A. Houghten. 1984. Differences in cross protection in rats immunized with the B subunits of cholera toxin and *Escherichia coli* heat-labile toxin. *Infect. Immun.* 43: 811-816.
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- Clements, J.D., F.L. Lyon, and R.F. Garry. 1987. Immunological protection against mucosal pathogens by direct stimulation of antibody-forming cells in the gut-associated lymphoid tissues. *In* J.A. Majde (ed.), *Immunopharmacology of infectious diseases. Vaccine Adjuvants and Modulators of Non-Specific Resistance*. Alan R. Liss, Inc. N.Y. p.p. 139-154.
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- Clements, J.D. 1989. Use of attenuated mutants of *Salmonella* as vaccine vectors. *In* R.M. Channok, S.S. Ginsberg, R.A. Lerner, and F. Brown (ed.), *Vaccines 89: Modern approaches to new vaccines including prevention of AIDS*. Cold Spring Harbor Laboratory, Cold Spring Harbor, N.Y. p.p. 283-290.

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- Clements, J.D., J.X. Bao, and L. Cárdenas. 1992. Use of attenuated bacteria as live oral vaccine vectors. *In* R.E. Isaacson (ed.), *Recombinant DNA Vaccines: Rationale and Strategy*. Marcel Decker, New York. p.p. 293-321.
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- Cárdenas, L., and J.D. Clements. 1993. Stability, immunogenicity, and expression of foreign antigens in bacterial vaccine vectors. *Vaccine* 11:126-135.
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- Cárdenas, L., U. Dasgupta, and J.D. Clements. 1994. Influence of Strain Viability and Antigen Dose on the Use of Attenuated Mutants of *Salmonella* as Vaccine Carriers. *Vaccine* 12: 833-840.
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- Takahashi, I., I. Nakagawa, H. Kiyono, J.R. McGhee, J.D. Clements, and S. Hamada. 1995. Mucosal T cells induce systemic anergy for oral tolerance. *Biochem. Biophys. Res. Com.* 206:414-420.

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- Takahashi, I., M. Marinaro, H. Kiyono, R.J. Jackson, I. Nakagawa, K. Fujihashi, S. Hamada, J.D. Clements, K.L. Bost, and J.R. McGhee. 1996. Mechanisms for mucosal immunogenicity and adjuvant activity of *Escherichia coli* labile enterotoxin. *J. Infect. Dis.* 173:627-635.
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- Takahashi, I., H. Kiyono, R.J. Jackson, K. Fujihashi, H.F. Staats, S. Hamada, J.D. Clements, K.L. Bost, and J.R. McGhee. 1996. Epitope maps of the *Escherichia coli* heat-labile toxin B subunit for development of a synthetic oral vaccine. *Infect. Immun.* 64:1290-1298.
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- Chong, C., M. Friberg, and J.D. Clements. 1998. LT(R192G), a non-toxic mutant of the heat-labile enterotoxin of *Escherichia coli*, elicits enhanced humoral and cellular immune responses associated with protection against lethal oral challenge with *Salmonella* spp. *Vaccine* 16:732-740.
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## Patents Held

U.S. Patent No. 4,411,888

"Composition of a novel immunogen for protection against diarrheal disease caused by *Escherichia coli* "

F.A. Klipstein, R.F. Engert, J.D. Clements

U.S. Patent No. 4,808,700

"Immunogenic conjugates of nontoxic *E. coli* LT-B enterotoxin subunit and capsular polymers"

P.W. Anderson, J.D. Clements

Australian Patent No. AU-B-44587/85

"Genetically engineered *E. coli* LT-B enterotoxin subunit"

J.D. Clements

Australian Patent No. AU-B-44588/85

"Immunogenic conjugates of *E. coli* heat-labile (subunit B) enterotoxin"

P.W. Anderson, J.D. Clements

U.S. No. 5,079,165

"Production of the *E. coli* LT-B enterotoxin subunit in *Salmonella typhi*"

J.D. Clements, S. El-Morshidy

U.S. No. 5,308,835

"Production of the *E. coli* LT-B enterotoxin subunit"

J.D. Clements

South African Patent No. 95/6412

"Mutant enterotoxin effective as a non-toxic oral adjuvant"

J.D. Clements, B.L. Dickinson

South African Patent No. 98/0738

"Mutant enterotoxin effective as a non-toxic adjuvant for HIV"

J.D. Clements, B.L. Dickinson

U.S. Patent No. 6,019,982

"Mutant enterotoxin effective as a non-toxic oral adjuvant"

J.D. Clements, B.L. Dickinson

U.S. Patent No. 6,436,407

"Mutant enterotoxin effective as a non-toxic oral adjuvant"

J.D. Clements, B.L. Dickinson

U.S. Patent No. 6,033,673

"Double mutant enterotoxin for use as an adjuvant"

J.D. Clements

U.S. Patent No. 6,395,964

"Production of orally immunogenic bacterial proteins in transgenic plants"

C.J. Arntzen, H.S. Mason, T.A. Haq, J.D. Clements

U.S. Patent No. 6,413,523

"Pharmaceutical composition of *Escherichia coli* heat-labile enterotoxin adjuvant and methods of use"

J.D. Clements

U.S. Patent No. 7,063,852

"Hybrid LT-A/CT-B holotoxin for use as an adjuvant"

J.D. Clements