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When science matters.

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CURRICULUM VITAE
Cindy S. Orser, Ph.D.

US Citizen

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More than 25 years experience as an Innovator, Principal Investigator and Entrepreneur in both Academics and Industry with responsibility for the conceptualization and management of key projects at the lab bench, coordination of funding, hiring and mentoring personnel, identifying outside collaborators in Academics and Industry, coordinating subcontractors, animal studies and sample acquisition, interfacing with the FDA, CDC, ARC and other Federal and International agencies for regulatory compliance. Strength centered on visionary, strategic planning and execution.

Hands on experience in the preparation, submission and compliance with sponsor guidelines on 40 competitive grant and contract awards ranging from \$4,000 to over \$3M from: the DHS, USAF OSG, DARPA, NHLBI, NCI, NIDDK, ARMY OSD, USDA, EPA, DOE, USGS, NSF, DEFRA (UK) and Alliance Biosecure (France) across a broad field of scientific inquiry marked by innovation and success with 27 issued and pending patents and 48 peer-reviewed publications.

EDUCATIONAL BACKGROUND:

B.S., 1978, Montana State University, Botany
Ph.D., 1985, University of California, Berkeley, Plant Pathology (Genetics)
Postdoctoral Fellow, 1985-1987, Purdue University, Biology

PROFESSIONAL EXPERIENCE:

Board Member, Digipath Inc. & Emerald Scientific Advisory Board, 2018-present

Chief Scientific Officer & Laboratory Director, June 2014-present, DigiPath Inc. and DigiPath Labs Inc., Las Vegas NV

Envisioned, designed, built out, staffed and indoctrinated a reproducible state-of-the-art flagship cannabis testing laboratory in Las Vegas, NV. Responsible for development of all testing SOPs, hiring and mentoring of staff, validation, accreditation and R&D for process and product development.

President & Senior Science Advisor, 2007-present, Big Sky Biosystems Inc., Boulder CO

Big Sky Biosystems (BSB) provides scientific, technical, regulatory and strategic affairs consulting for the molecular, medical and cannabis diagnostics industry. BSB participated in developing and writing a 400 pg Roadmap and Guidelines for Modernization of Molecular Diagnostics for the Assistant Air Force Surgeon General and has provided consulting to cannabis and biotech start-ups.

Research Program Director, May 2014 to Nov 2014, State of Montana, Office of the Commissioner of Higher Education, Helena MT

Leader and coordinator of the state research agenda, reporting to the Deputy Commissioner of Higher Education for Academic, Research and Student Affairs and serving the governing Board

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of Regents of Higher Education. A position vital to increasing the visibility and state awareness of university research and its important role in Montana's communities and economy.

COO and co-founder, 2007-2012, ASDx Biosystems Inc., Boulder CO

ASDx Biosystems developed rapid diagnostic assays for the detection of biological toxins including ricin, abrin and botulinum toxins, managing all aspects of analytical and validation studies with the CDC and the Laboratory Response Network. iPDx Biosciences, the parent company of ASDx, focused on fundamental biomarker research for early screening of chronic disease associated with metabolic syndrome including diabetes, chronic kidney disease, and neurodegenerative disease states involving the heteroaggregation of misfolded proteins.

VP of Research & Development and co-founder, 2003-2007, ADLYFE Inc, Rockville MD

Responsible for the management of all aspects of bringing an innovative blood diagnostic for misfolded proteins associated with prion-mediated neurodegenerative disease to market which involved creating extensive animal disease models under BL3 requirements. At the same time, I managed the spin out of Adlyfe's stabilized human platelet product for therapeutic interventions in advanced wound care and transfusion into Cellphire in 2006. I established numerous research collaborations including with: the American Red Cross, Brigham & Womens Hospital, Harvard Medical School, Princeton University, Univ of North Texas Medical School, Georgetown University, The Moredun Institute (Edinburgh), Prionics, Chiron (now Novartis), BioRad, Microsens, the Mayo Clinic Jacksonville, UPenn Medical School, RadBoud University (Netherlands), Sahlgrenska University Hospital (Sweden).

Corporate Senior Scientist, 1999-2003, Areté Associates, Arlington VA

Areté Associates is a physics-based Defense company and leader in the design, integration, and operation of *in situ* and remote sensing instrumentation. I was recruited as the sole biologist to initiate, fund and manage a biosensor R&D effort focused on detecting relevant low signals among high background. I conceived and oversaw two biosensor projects: amperometric-based biosensors for environmental contaminants and infectious agent biosensors with a novel invention for misfolded proteins with prototype application for a prion diagnostic sensor. I also developed a predictive modeling and simulation software for first responders for both chemical and biological agents as well as a quantitative assessment of biothreats that became a classified study for the DARPA.

Director of Scientific Affairs, 1996-1999, NuCycle Therapy Inc., Monmouth Junction NJ

I envisioned and executed NuCycle Therapy (formerly Phytotech Inc.) into the nutraceutical market by redirection of technology and strategizing animal and human nutritional trials, through an award from the National Cancer Institute to develop a novel carcinostatic product, by identifying product opportunities, outlining future products and making key industry and academic contacts for product licensing and validation.

Group Leader, 1993-1995, Xenometrix, Inc., Boulder CO

Xenometrix, Inc. was a molecular toxicology company focused on developing *in vitro* molecular assay alternatives to whole animal testing. I managed the development and commercialization of novel molecular stress diagnostic assays and evaluated the feasibility of an animal model for estimating *in vivo* mutation rates in mammals coordinating animal testing with outside companies and academic facilities.

Assistant/Associate, Tenured Professor of Bacteriology & Biochemistry, 1987-1993, University of Idaho, Moscow ID

While at the University, I initiated, funded and managed a successful research group working on the genetics, biochemistry and molecular evolution of microbial dehalogenation reactions and continued my doctoral research studies in ice nucleation. At the same time, I participated in

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graduate and undergraduate education and faculty governance, publishing 26 peer-reviewed manuscripts and receiving early tenure and promotion.

ACADEMIC SERVICE:

Affirmative Action Committee
Agricultural Marketing Committee
Biohazards IBC Committee
Animal Use & IACUC
Graduate Studies Committee, Chair
Research Council
Radiation Safety Committee
Scientific Misconduct Committee

GRANT REVIEWER FOR:

DOE, EPSCoR, Site Team, 1997
DOE, Cellular Biosciences, 1990
NSF, Biochemistry, Genetics, 1991, 1992, 1994, 1996
Panel Member, Metabolic Biochemistry, 1996
Cluster Coordinator, NSF-EPSCoR, 1992-93
DOE, Basic Energy Sciences, 1989, 1990
USDA, ARS, Potato Research, 1989-1992
USDA, CRGP, Biological Nitrogen Fixation, 1989, 1990, 1991
USDA, CRGP, Plant Pathology/Weed Science, 1989-1997
USDA, NRICGP, Water Quality, 1992, 1993 (Panel member), 1994
US Army, National Prion Research Program, 2002 (Panel member)
NIA, Panel member, CWRU project review, 2006-2007
USAF, OSG, Molecular Diagnostics, 2007-2009

TEACHING EXPERIENCE:

Molecular Genetics, upper division/graduate level (6 semesters)
Recombinant DNA Laboratory, upper division/graduate level (3 semesters)
Bacteriology & Biochemistry Seminar series (3 semesters)

GRANTS & CONTRACTS:

ACADEMIC RESEARCH GRANTS RECEIVED:

- Osmotolerance as a component in rhizosphere competence, State of Idaho Economic Development Grant, 1987-1988, \$21,900.
- Increased nitrogen content in legumes through proline overproduction by *Rhizobium leguminosarum*, Idaho-Washington Dry Pea and Lentil Commission, 1988-1989, \$4,000.
- Analysis of pathogenicity and ice nucleation loci of *Xanthomonas campestris* pv. *translucens*, Idaho Wheat Commission, 1988-1989, \$8,500.
- Proline overproduction by *Rhizobium leguminosarum*, UI Research Council Seed Grant, 1988-1989, \$3,000.
- Promoting *In-situ* dechlorination of aromatic compounds through catalysis by extracellular enzymes, EPA, 1988-1991, \$197,590 (co-PI).
- Engineering of salt/drought tolerance in plants: the role of proline biosynthesis, ISBE, 1989-1990, \$35,000
- Metabolites accumulated in stressed pea nodules as modulators of oxygen-leghemoglobin binding, NSF EPSCoR, 1989-1992, \$390,004
- Selection for and enhancement of biotic antifungal activity in potato field soils, J.R. Simplot Company, 1990-1992, \$113,455
- Containment of genetically engineered microorganisms after application to subsurface

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- environments, USGS, 1990-1992, \$234,381 (co-PI).
- Identification of metabolites accumulated in salt stressed pea nodules, NSF/REU, 1990 and 1991, \$8,000
- Clays as carriers for microbial biocontrol agents, IMAGE (campus), 1990-1992, \$30,000 (co-PI)
- In situ dehalogenation of synthetic organic compounds, Center for Hazardous Waste Remediation Research (campus), \$81,904, 1990-1992 (co-PI)
- Molecular evolution of bacterial ice nucleation genes via horizontal gene transfer, Idaho-SBOE, \$30,800, 1991-1992 (co-PI)
- Isolation and characterization of pathogenicity genes of the bacterial ring rot agent, *Clavibacter michiganense* subsp. *sepedonicum*, USDA/ARS, 1988-1994, \$254,412.
- Application of GEMS for remediation of chloroaromatics, USDA-Water Quality, \$70,000, 1991-1993 (co-PI)
- Molecular analysis of dehalogenation of pentachlorophenol, USDA-NRICGP, \$185,957, 1991-1993
- Molecular analysis of dehalogenation of pentachlorophenol, USDA-NRICGP, \$250,000, 1993-1996
- Studies of tetrachloro-1,4-hydroquinone dehalogenase, NSF-MCB, Biochemistry, \$320,000, 1994-1997 (co-PI)

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INDUSTRY RESEARCH GRANTS/CONTRACTS

- Enhanced phytochelation and uptake of heavy metals, USDA-SBIR, Phase I, \$55,000, 1997
- Integrated approach to the remediation of heavy-metal contaminated land, DOE, subcontract Florida State University and Institute for Ecology of Industrial Areas (IETU) Poland. \$120,000, 1997-98
- Phytoremediation of U-contaminated soils, DOD-Army SBIR, Phase I, \$72,000, 1995
- Phytoremediation of U-contaminated soils, DOD-Army SBIR Phase II, \$900,000, 1996-98
- Selenium enriched plant material for chemoprevention, NIH (Cancer Biology) STTR, Phase I \$100,000 1999.
- Selenium enriched plant material for chemoprevention, NIH (Cancer Biology) STTR Phase II, was funded at \$550,000 2000-02.
- SIMBAD WA1, DARPA SPO, \$300,000. 2000-02.
- Biothreat Analysis, DARPA SPO, \$409,338. 2000.
- Catalytic Conformational TSE Sensor, DARPA DSO, \$1,342,000. 2001-04
- MASC Technology, EPA (Water Quality) SBIR Phase I, \$70,000. 2002
- Early Detection of Prion Diseases, NIH-NHLBI, SBIR Phase I, \$102,000, 2002
- Early Detection of Prion Diseases, NIH-NHLBI, SBIR Phase II, \$750,000, 2003-05
- Early Detection of Prion Diseases, NIH-NHLBI, SBIR Phase II add-on, \$680,000, 2005-06
- Stabilized Platelets for Enhanced Wound Healing, NIH-NIDDK Phase I, \$100,000, 2004-05
- Stabilized Platelets for Advanced Wound Healing, ARMY, Phase I & II, \$850,000, 2004-07
- Clinical Development of Stabilized Platelets for Hemostasis, DARPA DSO, \$1,750,000, 2005-06
- UK DEFRA, A Rapid Sensitive Live Animal Prion Blood Test. \$630,000, 2005-2007
- Optimization of Blood Test for Misfolded Proteins, ARMY, Phase I, \$100,000, 2006
- Optimization of Blood Test for Misfolded Proteins, ARMY, Phase II, \$750,000, 2007-08
- Luminescent Immunoassays for the Detection of Ricin and Botulinum Toxins, DHS, \$3,125,121, 2008-2012

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- A Missing Link between Prion and other Neurodegenerative Diseases, Alliance Biosecure Research Foundation (France) \$30,000, 2011–2012

PATENTS:

- “Method for Detecting Misfolded Proteins & Prions,” Feb 12, 2013, US 8,372,593
- “Misfolded Protein Sensor Method,” Nov 22, 2011, US 8,062,895
- “Use of Stabilized Platelets as Hemostatic Agent,” Oct 10, 2010, US 7,811,558
- “Misfolded Protein Sensor Method,” Apr 6, 2010, US 7,691,639
- “Nutritional Supplements containing Methylselenocysteine,” Apr 6, 2010, US 7,691,429
- “Misfolded Protein Sensor Method in Body Fluids,” Jan 23, 2007, US 7,166,471.
- “Nitrate Sensor,” Jan 9, 2007, US 7,160,690
- “Methods for accumulating selenium in edible brassica,” Oct 25, 2005, US 6,958,435
- “Nutritional Supplements containing Methylselenocysteine,” Mar 3, 2002, WO/2002/021940, PCT/US2001/028485
- “Methods for Preparing Freeze-dried Platelets, Compositions comprising Freeze-dried Platelets, and Methods of Use,” May 16, 2007, EP1784639
- “Peptide Probes for Diagnostic and Therapeutics,” July 26, 2007, WO2008013859
- “Pronucleon A β Peptide Activity Affecting the Soluble State of A β ,” 2006 U.S. *Provisional filing*.
- Methods for preparing freeze-dried platelets, compositions comprising freeze-dried platelets, and methods of use, Aug 12, 2005, WO2006020773
- "Genes and Enzymes Involved in Microbial Degradation of Pentachlorophenol," Nov 15, 1994, US 5,364,787
- *Ibid*, Apr 30, 1996, US 5,512,478
- "Ice Nucleation Deficient Microorganisms by Genetic Manipulation," Aug 23, 1988, US 4,766,077
Ibid, April 24, 1985, EPO138426
- "Fluorescent Siderophore Genes," Sept 10, 1985, US 4,540,667
- "Ice Nucleating Microorganisms," Aug 7, 1984, US 4,464,473

PEER-REVIEWED RESEARCH PUBLICATIONS:

Cassiday B, Orser C (2018) Cannabis Uncertainty. *Cannabis Science & Technology* Vol 1. No. 3 (Sept 24th).

Reimann-Philipp U, Speck M, Orser C, Johnson S, Hilyard A, Turner H, Stokes A, Small-Howard A (2018) Cannabis Strain Nomenclature Misrepresents Chemical and Genetic Diversity; *Surveying variations in chemical profiles and genetic markers in medical cannabis samples in Nevada*. *Cannabis and Cannabinoid Research* (*pending*)

Henry P, Johnson S, Hilyard A, Orser C (2018) On the Classification of Cannabis Chemovars using Targeted Single Nucleotide Polymorphism (SNP) Assays. *Peer J* (*pending*)

Orser CS (2018) Empowering the Cannabis Consumer in a Rapidly Expanding Global Market. *Cannabis Science & Technology* Vol 1. No. 1

Orser CS, Johnson S, Speck M, Hilyard A, Afia I (2017) Terpenoid Chemoprofiles Distinguish Drug-Type Cannabis sativa L. Cultivars in Nevada. *Natl Prod Chem Res* 5:8. DOI: 10.4172/2329-6836.1000304.

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Orser CS (2016) Safety of Medical Cannabis Products: What Every Patient Should Know. Cannabis Nursing Magazine, March/April 2016, pp. 7-12.

Pan T, Sethi J, Nelsen C, Cervenakova L, Rudolph A, Brown P, Orser CS (2007) Detection of PrP^{sc} in blood using conformationally sensitive peptides. Transfusion 47:1418-25.

Pietramaggiore G, Kaipainen A, Ho D, Orser C, Pebley W, Rudolph A, Orgill D (2007) TREHALOSE FREEZE-DRIED PLATELETS FOR WOUND HEALING. Wound Repair Regen 15:213-20.

Sum R, Hager S, Pietramaggiore G, Orgill DP, Dee J, Rudolph A, Orser C, Ho D (2007) Wound Healing Properties of Trehalose Stabilized Freeze-Dried Outdated Platelets. Transfusion 47:672-9.

Grosset, A., K. Moskowitz, C. Nelsen, T. Pan, E. Davidson, and C.S. Orser. 2005. Rapid presymptomatic detection of PrP^{sc} via conformationally responsive palindromic PrP peptides. Peptides 26:2193-2200.

Ellis, D.R., Brunk, D.G., Wright, C., Orser, C., Lahner, B., Harris, H.H., Pickering, I.J., D.E. Salt (2004) Production of Se-methylselenocysteine in transgenic plants expressing selenocysteine methyltransferase. BMC Plant Biol. 4:1-6.

Tcherkasskaya O, Sanders W., Chynwat V., Davidson EA, Orser CS (2003) The role of hydrophobic interactions in amyloidogenesis: example of prion-related polypeptides. J Biomolecular Structure & Dynamics 21:353-365.

Tcherkasskaya, O., E. Davidson, M.J. Schmerr, K.A. Moskowitz, and C.S. Orser. 2003. Advanced diagnostic strategy for prion diseases. In *Proceedings: Molecular aspects of transmissible spongiform encephalopathies*. A Keystone Symposium, Breckenridge, CO.

Orser, C.S., D. Salt, I.J. Pickering, R. Prince, A. Epstein, and B.D. Ensley. 2000. Brassica plants to provide enhanced human mineral nutrition: selenium phytoenrichment and metabolic transformation. J. Medicinal Foods 1:45-52

Epstein, A., C. Gussman, M. Blaylock, J. Huang, Y. Kapulnik, and C.S. Orser. 1999. EDTA and Pb-EDTA accumulation in *Brassica juncea* grown in Pb contaminated soil. Plant & Soil 208:87-92.

Morra, M.J., M.H. Chaverra, and C.S. Orser. 1998. Survival of *Pseudomonas fluorescens* 2-79RN 10 in clay powders undergoing drying. Soil Science Society of America J. 62:663-667.

Ederer, M.M., R.L. Crawford, R.P. Herwig, and C.S. Orser. 1997. Pentachlorophenol degradation is mediated by closely related species of the genus *Sphingomonas*. Molecular Ecology 6:39-49.

Lange, C.C., B.J. Schneider, and C.S. Orser. 1996. Verification of the role of PCP 4-monooxygenase in chlorine elimination from pentachlorophenol by *Flavobacterium* sp. strain ATCC 39723. Biochem. Biophys. Res. Commun. 219:146-149.

Orser, C.S., F.C.F. Foong, S.R. Capaldi, J. Nalezny, B. Mackay, and S.B. Farr. 1995. The use of prokaryotic stress promoters as indicators of the mechanisms of chemical toxicity. In Vitro Toxicology 8:71-85.

Edwards, A.R., R.A. Van Den Bussch, H.A. Wichman, and C.S. Orser. 1994. Unusual pattern of bacterial ice nucleation gene evolution. Mol. Biol. and Evolution 11:911-920.

Dandurand, L-M., M. Morra, M.H. Chaverra, and C.S. Orser. 1994. Survival of *Pseudomonas fluorescens* 2-79RN in air dried mineral powders. Soil Biol. Biochem. 26:1423-30.

Orser, C.S. and C.C. Lange. 1994. Molecular Analysis of Pentachlorophenol Degradation. In: Genetics of Biodegradation of Synthetic Compounds. Kluwer Publishers, Dordrecht, the Netherlands. Biodegradation 5:277-288. .

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- Orser, C.S., J. Dutton, C. Lange, P. Jablonski, L. Xun, and M. Hargis. 1993. Characterization of a *Flavobacterium* glutathione-S-transferase gene involved in reductive dechlorination. *J. Bacteriol.* 175:2640-2644.
- Schneider, J., J. Zhou, and C.S. Orser. 1993. Detection of *Clavibacter michiganensis* subsp. *sepedonicus* by DNA amplification. *FEMS Microbiol. Lett.* 109:207-212.
- Orser, C.S., C.C. Lange, L. Xun, T.C. Zahrt, and B.J. Schneider. 1993. Cloning, sequence analysis, and expression of the *Flavobacterium* pentachlorophenol-4-monooxygenase gene in *E. coli*. *J. Bacteriol.* 175:411-416.
- Dandurand, L.M., M.J. Morra, M.H. Chaverra, and C.S. Orser. 1993. Survival of *Pseudomonas* spp. in air-dried mineral powders. *Soil Biol. & Biochem.* 26:1423-1430.
- Xun, L., E. Topp, and C.S. Orser. 1992. Purification and characterization of a tetrachloro-*p*-hydroquinone reductive dehalogenase from *Flavobacterium* sp. *J. Bacteriol.* 174:8003-8007.
- Xun, L., E. Topp, and C.S. Orser. 1992. Confirmation of oxidative dehalogenation of pentachlorophenol by a *Flavobacterium* pentachlorophenol hydroxylase. *J. Bacteriol.* 174:5745-5747.
- Xun, L., E. Topp, and C.S. Orser. 1992. Diverse substrate range of a *Flavobacterium* pentachlorophenol hydroxylase and reaction stoichiometries. *J. Bacteriol.* 174:2898-2902.
- Xun, L., E. Topp, and C.S. Orser. 1992. Glutathione is the reducing agent for the reductive dehalogenation of tetrachloro-*p*-hydroquinone by extracts from a *Flavobacterium* sp. *Biochem. Biophys. Res. Comm.* 182:361-366.
- Topp, E., L. Xun, and C.S. Orser. 1992. Biodegradation of the herbicide bromoxynil (3,5-dibromo-4-hydroxybenzotrile) by purified pentachlorophenol hydroxylase and whole cells of *Flavobacterium* sp. strain ATCC 39723 is accompanied by cyanogenesis. *Appl. Environ. Microbiol.* 58:502-506.
- Chien, C-T., J. Maundu, J. Cavaness, L-M. Dandurand, and C.S. Orser. 1992. Characterization of salt tolerant and salt sensitive mutants of *Rhizobium leguminosarum* biovar *viciae* strain C1204b. *FEMS Microbiol. Lett.* 90:135-140.
- Xun, L. and C.S. Orser. 1991. Purification and properties of pentachlorophenol hydroxylase: a flavoprotein from *Flavobacterium* sp. ATCC 39723. *J. Bacteriol.* 173:4447-4453.
- Chien, C-T., K. Shetty, M. Mortimer, and C.S. Orser. 1991. Calcium-induced salt tolerance in *Rhizobium leguminosarum* biovar *viciae* strain C1204b. *FEMS Microbiol. Lett.* 83:219-224.
- Xun, L. and C.S. Orser. 1991. Purification of a pentachlorophenol-induced periplasmic protein PcpA and nucleotide sequence of the corresponding gene from a *Flavobacterium* sp. *J. Bacteriol.* 173:2920-2926.
- Xun, L. and C.S. Orser. 1991. Biodegradation of tribromophenol and triiodophenol by a pentachlorophenol-degrading *Flavobacterium* sp. *Bioch. Biophys. Res. Commun.* 174:43-48.
- Chien, C-T., R. Rupp, S. Beck, and C.S. Orser. 1991. Proline auxotrophic and catabolic mutants of *Rhizobium leguminosarum* biovar *viciae* strain C1204b are unaffected in nitrogen fixation. *FEMS Microbiol. Letters* 77:299-302.
- Zhao, J. and C.S. Orser. 1990. Conserved repetition in the ice nucleation gene *inaX* from *Xanthomonas campestris* pv. *translucens*. *Mol. Gen. Genetics* 223:163-166.
- Orser, C.S. and C. Beck. 1990. Immunological techniques for molecular plant pathology," *In: Serological Identification of Plant Viral and Bacterial Pathogens.* Hampton, R.O. (ed.), APS Press, St. Paul, Minn. pp. 353-364.

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Csonka, L.N., S.B. Gelvin, B.W. Goodner, C. Orser, D. Siemieniak, and J. Slightom. 1988. DNA sequence of a *proB* mutation that results in enhanced osmotic stress tolerance in bacteria. *Gene* 64:199-205.

Orser, C.S., L.N. Csonka, S.B. Gelvin, and M. Johnston. 1988. The *Escherichia coli proB* gene corrects the proline auxotrophy of *Saccharomyces cerevisiae pro1* mutants. *Mol. Gen. Genet.* 212:124-128.

Kim, H.K., C.S. Orser, S.E. Lindow, and D.C. Sands. 1987. *Xanthomonas campestris* pv. *translucens* strains active in ice nucleation. *Plant Disease* 71:994-998.

Hickman, M.J., C.S. Orser, D.K. Willis, S.E. Lindow, and N.J. Panopoulos. 1987. Molecular cloning and biological characterization of the *recA* gene from *Pseudomonas syringae* pv. *syringae*. *J. Bacteriol.* 169:2906-2910.

Orser, C.S., B.J. Staskawicz, N.J. Panopoulos, and S.E. Lindow. 1985. Cloning and expression of bacterial ice nucleation genes in *Escherichia coli*. *J. Bacteriol.* 164:359-366.

Orser, C.S., R. Lotstein, B.J. Staskawicz, D. Dahlbeck, E. Lahue, D.K. Willis, S.E. Lindow, and N.J. Panopoulos. 1984. Molecular genetics of bacterial ice nucleation. In: Proceedings of the 2nd working group on *Pseudomonas syringae* pathovars. C.G. Panagopoulos, P.G. Psallidas, A.S. Alivizatos (Eds.)

Loper, J.C., C.S. Orser, N.J. Panopoulos, and M.N. Schroth. 1984. Genetic analysis of fluorescent pigment production in *Pseudomonas syringae* pv. *syringae*. *J. Gen. Microbiol.* 130:1507-1515.

Orser, C.S., B.J. Staskawicz, J. Loper, N.J. Panopoulos, D. Dahlbeck, and S.E. Lindow. 1983. Cloning of the genes involved in bacterial ice nucleation and fluorescent pigment/siderophore production. In: Molecular Genetics of the Bacteria-Plant Interaction. A. Puhler (Ed.), Springer-Verlag, Berlin, West Germany. pp. 353-361.