

Table of Contents

CONTRIBUTORS TO VOLUME 268.	xi
PREFACE.	xvii
VOLUMES IN SERIES	xix

Section I. Generation, Detection, and Characterization of Biological and Chemical Sources of Nitric Oxide A. Nitric Oxide Chemistry and Biology

1. Say NO to Nitric Oxide: Nomenclature for Nitro- gen- and Oxygen-Containing Compounds	W. H. KOPPENOL AND J. G. TRAYNHAM	3
2. Thermodynamics of Reactions Involving Nitrogen- Oxygen Compounds	W. H. KOPPENOL	7
3. Direct and Indirect Effects of Nitric Oxide in Chem- ical Reactions Relevant to Biology	DAVID A. WINK, MATTHEW B. GRISHAM, JAMES B. MITCHELL, AND PETER C. FORD	12
4. Diffusion of Free Nitric Oxide	JACK R. LANCASTER, JR.	31
5. Nitric Oxide Gas	FRANCIS T. BONNER	50

B. Methods for Detection of Nitric Oxide

6. Nitric Oxide Measurement Using Electrochemical Methods	TADEUSZ MALINSKI, STEFAN MESAROS, AND PAUL TOMBOULIAN	58
7. Electrochemical Methods for Detection of Nitric Oxide	DANAE CHRISTODOULOU, SETSUKO KUDO, JOHN A. COOK, MURALI C. KRISHNA, ALLEN MILES, MATTHEW B. GRISHAM, RAMACHANDRAN MURUGESAN, PETER C. FORD, AND DAVID A. WINK	69

8. Chemiluminescence Headspace-Gas Analysis for Determination of Nitric Oxide Formation in Biological Systems	JAMES F. BRIEN, BRIAN E. McLAUGHLIN, KANJI NAKATSU, AND GERALD S. MARKS	83
9. Colorimetric Assays for Nitric Oxide and Nitrogen Oxide Species Formed from Nitric Oxide Stock Solutions and Donor Compounds	RAYMOND W. NIMS, JOHN C. COOK, MURALI C. KRISHNA, DANAE CHRISTODOULOU, CHARLES M. B. POORE, ALLEN M. MILES, MATTHEW B. GRISHAM, AND DAVID A. WINK	93
10. Determination of Nitric Oxide Using Fluorescence Spectroscopy	ALLEN M. MILES, DAVID A. WINK, JOHN C. COOK, AND MATTHEW B. GRISHAM	105
11. Determination of Selectivity of Reactive Nitrogen Oxide Species for Various Substrates	DAVID A. WINK, MATTHEW B. GRISHAM, ALLEN M. MILES, RAYMOND W. NIMS, MURALI C. KRISHNA, ROBERTO PACELLI, DIANE TEAGUE, CHARLES M. B. POORE, JOHN A. COOK, AND PETER C. FORD	120
12. Quantitation of Nitrate, Nitrite, and Nitrosating Agents	JOHN S. WISHNOK, JOSEPH A. GLOGOWSKI, AND STEVEN R. TANNENBAUM	130
13. Measurement of Nitrate and Nitrite in Biological Samples Using Nitrate Reductase and Griess Reaction	DONALD L. GRANGER, READ R. TAINTOR, KENNETH S. BOOCKVAR, AND JOHN B. HIBBS, JR.	142
14. Analysis of Nitrite, Nitrate, and Nitric Oxide Synthase Activity in Brain Tissue by Automated Flow Injection Technique	ISAO YOKOI, HITOSHI HABU, HIDEAKI KABUTO, AND AKITANE MORI	152
15. Microtiter Plate Assay for Determining Kinetics of Nitric Oxide Synthesis	STEVEN S. GROSS	159
16. Detection of Nitric Oxide by Electron Spin Resonance in Chemical, Photochemical, Cellular, Physiological, and Pathophysiological Systems	B. KALYANARAMAN	168
17. <i>In Vivo</i> Spin Trapping of Nitric Oxide by Heme: Electron Paramagnetic Detection Resonance <i>ex Vivo</i>	DAVID M. HALL AND GARRY R. BUETTNER	188

18. Electron Spin Resonance and Mass Spectral Analysis of Interactions of Ferrylhemoglobin and Ferrylmyoglobin with Nitric Oxide	ANATOLY N. OSIPOV, NIKOLAI V. GORBUNOV, BILLY W. DAY, NABIL M. ELSAYED, AND VALERIAN E. KAGAN	193
19. Electron Spin Resonance for Spin Trapping of 3,5-Dibromo-4-nitrosobenzene Sulfonate	KOHJI ICHIMORI, CARMEN M. ARROYO, AND HIROE NAKAZAWA	203
20. Quantitation of Nitric Oxide Using 2-Phenyl-4,4,5,5-tetramethylimidazoline-1-oxyl 3-Oxide Derivatives in Biological Systems (PTIO)	TAKAAKI AKAIKE AND HIROSHI MAEDA	211
21. Continuous and Quantitative Monitoring of Rate of Cellular Nitric Oxide Generation	YASHIGE KOTAKE	222
22. Electron Paramagnetic Resonance Characterization of Rat Neuronal Nitric Oxide Production <i>ex Vivo</i>	ANDREY V. KOZLOV, ANNA BINI, ANNA IANNONE, ISABELLA ZINI, AND ALDO TOMASI	229
23. Quantitation of Nitrate and Nitrite in Extracellular Fluids	MATTHEW B. GRISHAM, GLENDA G. JOHNSON, AND JACK R. LANCASTER, JR.	237
24. Stirred Reactor with Continuous Nitric Oxide Sampling for Use in Kinetic Studies	RANDY S. LEWIS AND WILLIAM M. DEEN	247

C. Nitric Oxide Donors, Nitric Oxide Deactivation, and Nitric Oxide Gas

25. Nitric Oxide Generation from Pharmacologic Nitric Oxide Donors	NARENDRA S. KISHNANI AND HO-LEUNG FUNG	259
26. Photolabile Donors of Nitric Oxide: Ruthenium Nitrosyl Chlorides as Caged Nitric Oxide	NADIR BETTACHE, TOM CARTER, JOHN E. T. CORRIE, DAVID OGDEN, AND DAVID R. TRENTHAM	266
27. "NONOates" (1-Substituted Diazen-1-ium-1,2-diolates) as Nitric Oxide Donors: Convenient Nitric Oxide Dosage Forms	LARRY K. KEEFER, RAYMOND W. NIMS, KEITH M. DAVIES, AND DAVID A. WINK	281
28. S-Nitrosothiol Detection	GEORGE N. WELCH, GILBERT R. UPCHURCH, JR., AND JOSEPH LOSCALZO	293
29. S-Nitrosothiols and Role of Metal Ions in Decomposition to Nitric Oxide	D. LYN H. WILLIAMS	299

Section II. Biochemistry and Molecular Biology of Enzymes and Proteins Associated with Nitric Oxide Metabolism

A. Nitric Oxide Synthase: Reduction Mechanism, Purification, and Activity Assays

30. Binding Sites of Nitric Oxide Synthases	QING LIU AND STEVEN S. GROSS	311
31. Purification and Properties of Nitric Oxide Synthases	DENNIS J. STUEHR	324
32. Purification of Isoforms of Nitric Oxide Synthase	ULRICH FÖRSTERMANN AND INGOLF GATH	334
33. Purification and Inhibitor Screening of Human Nitric Oxide Synthase Isozymes	EDWARD P. GARVEY, ERIC S. FURFINE, AND PAULA A. SHERMAN	339
34. Generation of Isoform-Specific Antibodies to Nitric Oxide Synthases	TED M. DAWSON AND VALINA L. DAWSON	349
35. Determination of Nitric Oxide Synthase Cofactors: Heme, FAD, FMN, and Tetrahydrobiopterin	PETER KLATT, KURT SCHMIDT, ERNST R. WERNER, AND BERND MAYER	358

B. Inhibitors of Nitric Oxide Synthase Isozymes

36. Chemistry of N-Hydroxy-L-arginine	JON M. FUKUTO	365
37. Nitric Oxide Synthase Inhibitors: Amino Acids	OWEN W. GRIFFITH AND ROBERT G. KILBOURN	375
38. 7-Nitroindazole: An Inhibitor of Nitric Oxide Synthase	PHILIP K. MOORE AND PHILIP A. BLAND-WARD	393
39. Selective Inhibition of Inducible Nitric Oxide Synthase by Aminoguanidine	JOHN A. CORBETT AND MICHAEL L. MCDANIEL	398

C. Induction of Nitric Oxide Synthase

40. Biological Control and Inhibition of Induction of Nitric Oxide Synthase	CHIN-CHEN WU AND CHRISTOPH THIEMERMANN	408
41. Large-Scale Purification of Rat Brain Nitric Oxide Synthase from Baculovirus Overexpression System	BERND MAYER, PETER KLATT, BARBARA M. LIST, CHRISTIAN HARTENECK, AND KURT SCHMIDT	420

D. Molecular Cloning and Expression

- | | | |
|--|---|-----|
| 42. Cloned and Expressed Nitric Oxide Synthase Proteins | HOUHUI XIA AND
DAVID S. BRETT | 427 |
| 43. Posttranslational Modifications of Endothelial Nitric Oxide Synthase | LISA J. ROBINSON,
PEJMAN GHANOUNI, AND
THOMAS MICHEL | 436 |
| 44. Expression of Human Nitric Oxide Synthase Isozymes | IAN G. CHARLES,
CAROL A. SCORER,
MARÍA ÁNGELES MORO,
CONCHITA FERNÁNDEZ,
ANN CHUBB,
JOHN DAWSON,
RICHARD G. KNOWLES, AND
SALLY A. BAYLIS | 449 |

E. Nitric Oxide Synthase and Hemoprotein Homology

- | | | |
|--|--|-----|
| 45. Nitric Oxide Synthases: Analogies to Cytochrome P450 Monooxygenases and Characterization of Recombinant Rat Neuronal Nitric Oxide Synthase Hemoprotein | KIRK MCMILLAN,
JOHN C. SALERNO, AND
BETTIE SUE SILER MASTERS | 460 |
| 46. Carbon Monoxide and Nitric Oxide Homology: Differential Modulation of Heme Oxygenases in Brain and Detection of Protein and Activity | MAHIN D. MAINES | 473 |

F. Tissue Distribution of Nitric Oxide Synthase

- | | | |
|--|--|-----|
| 47. Localization of Neuronal Nitric Oxide Synthase | DANIEL S. CHAO,
PAUL M. HWANG,
FRED HUANG, AND
DAVID S. BRETT | 488 |
| 48. NADPH Diaphorase Activity in Activated Astrocytes Representing Inducible Nitric Oxide Synthase | MARK N. WALLACE | 497 |
| 49. Human Oral Neutrophils: Isolation and Characterization | EISUKE F. SATO,
KOZO UTSUMI, AND
MASAYASU INOUE | 503 |
| 50. Immunohistochemical Localization of Nitric Oxide Synthases | ULRICH FÖRSTERMANN AND
NAE J. DUN | 510 |
| AUTHOR INDEX | | 517 |
| SUBJECT INDEX | | 543 |