

*List of Publications: Original Articles - 1*

**Lutz Birnbaumer**

**At the Institute of Biochemical Research "Fundación Campomar" 1964-1966**

1. Appleman, M.M., Birnbaumer, L., and Torres, H.N. (1966) "Factors Affecting Muscle Glycogen Synthetase Activity. III. The Reaction with ATP, Mg<sup>++</sup> and Cyclic-3',5'-AMP." *Arch. Biochem. Biophys.* *116*, 39-43.
2. Torres, H.N., Birnbaumer, L., Garcia Fernandez, M. del C., Bernard, E., and Belocopitow, E. (1966) "Glycogen Metabolism in Muscle Homogenates. The Effect of Potassium Ions on Glycogen Synthesis." *Arch. Biochem. Biophys.* *116*, 59-68.
3. Birnbaumer, L. "Regulation of the Metabolism of Muscle Glycogen." (1966) Doctoral Thesis, Director: Dr. L.F. Leloir, Faculty of Pharmacy and Biochemistry, University of Buenos Aires, Argentina.
4. Belocopitow, E., Garcia Fernandez, M. del C., Birnbaumer, L., and Torres, H.N. (1967) "Factors Affecting Muscle Glycogen Synthetase Activity. IV. Comparative Study of the Different Dependent Forms of Glycogen Synthetase." *J. Biol. Chem.* *242*, 1227-1231.

**At the National Institutes of Health 1967-1971**

5. Birnbaumer, L., Pohl, S.L., and Rodbell, M. (1969) "Adenyl Cyclase in Fat Cells. I. Properties and the Effects of Adrenocorticotropin and Fluoride." *J. Biol. Chem.* *244*, 3468-3476.
6. Birnbaumer, L. and Rodbell, M. (1969) "Adenyl Cyclase in Fat Cells. II. Hormone Receptors." *J. Biol. Chem.* *244*, 3477-3482.
7. Pohl, M., Birnbaumer, L., and Rodbell, M. (1969) "Glucagon-sensitive Adenyl Cyclase in Plasma Membranes of Hepatic Parenchymal Cells." *Science* *164*, 566-567.
8. Rodbell, M., Birnbaumer, L., and Pohl, S.L. (1970) "Adenyl Cyclase in Fat Cells. III. Stimulation by Secretin and the Effects of Trypsin on the Receptors for Lipolytic Hormones." *J. Biol. Chem.* *245*, 718-722.
9. Krishna, G. and Birnbaumer, L. (1970) "On the Assay of Adenyl Cyclase." *Anal. Biochem.* *35*, 393-397.
10. Pohl, S.L., Birnbaumer, L., and Rodbell, M. (1971) "The Glucagon-sensitive Adenyl Cyclase System in Plasma Membranes of Rat Liver. I. Properties." *J. Biol. Chem.* *246*, 1849-1856.
11. Birnbaumer, L., Pohl, S. L., and Rodbell, M. (1971) "The Glucagon-sensitive Adenyl Cyclase System in Plasma Membranes of Rat Liver. II. Comparison between Glucagon- and Fluoride-stimulated Activities." *J. Biol. Chem.* *246*, 1857-1860.
12. Rodbell, M., Krans, H.M.J., Pohl, S.L., and Birnbaumer, L. (1971) "The Glucagon-sensitive Adenyl Cyclase System in Plasma Membranes of Rat Liver. III. Binding of Glucagon: Method of Assay and Specificity." *J. Biol. Chem.* *246*, 1861-1871.
13. Rodbell, M., Krans, H.M.J., Pohl, S.L., and Birnbaumer, L. (1971) "The Glucagon-sensitive Adenyl Cyclase System in Plasma Membranes of Rat Liver. IV. Binding of Glucagon: Effect of Guanyl Nucleotides." *J. Biol. Chem.* *246*, 1872-1876.
14. Rodbell, M., Birnbaumer, L., Krans, H.M.J., and Pohl, S.L. (1971) "The Glucagon-sensitive Adenyl Cyclase System in Plasma Membranes of Rat Liver. V. An Obligatory Role for Guanyl Nucleotides in Glucagon Action." *J. Biol. Chem.* *246*, 1877-1882.
15. Pohl, S.L., Krans, H.M.J., Kozyreff, V., Birnbaumer, L., and Rodbell, M. (1971) "The Glucagon-sensitive Adenyl Cyclase System in Plasma Membranes of Rat Liver. VI. Evidence for a Role of Membrane Lipids." *J. Biol.*

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Chem. 246, 4447-4454.

16. Rodbell, M., Birnbaumer, L., Pohl, S.L., and Sundby, F. (1971) "The Reaction of Glucagon with its Receptor: Evidence for Discrete Regions of Binding in the Glucagon Molecule." *Proc. Natl. Acad. Sci. USA* 68, 909-913.
17. Rodbell, M., Birnbaumer, L., and Pohl, S.L. (1971) "Characteristics of Glucagon Action on the Hepatic Adenylate Cyclase System." *Biochem. J.* 125, 178-179.
18. Goldfine, I., Roth, J., and Birnbaumer, L. (1972) "Glucagon Receptor in Beta Cells: Binding of <sup>125</sup>I-Glucagon and Activation of Adenylate Cyclase." *J. Biol. Chem.* 247, 1211-1218.
19. Birnbaumer, L., Pohl, S. L., Rodbell, M., and Sundby, F. (1972) "The Glucagon-sensitive Adenyl Cyclase System in Plasma Membranes of Rat Liver. VII. Hormonal Stimulation: Reversibility and Dependence on Concentration of Free Hormone." *J. Biol. Chem.* 247, 2038-2043.
20. Pohl, S. L., Krans, H. M. J., Birnbaumer, L., and Rodbell, M. (1972) "Inactivation of Glucagon by Plasma Membranes of Rat Liver." *J. Biol. Chem.* 247, 2295-2301.
21. Birnbaumer, L. and Pohl, S. L. (1973) "Relation of Glucagon-specific Binding Sites to Glucagon-dependent Stimulation of Adenylyl Cyclase Activity in Plasma Membranes of Rat Liver." *J. Biol. Chem.* 248, 2056-2061.

**At Northwestern University School of Medicine 1971-1975**

22. Kaumann, A. J. and Birnbaumer, L. (1973) "Adrenergic Receptors in Heart: Similarity of Apparent Affinities of *Beta*-Blockers for Receptors Mediating Adenylyl Cyclase Activity and Inotropic and Chronotropic Effects of Catecholamines." *Acta Physiol. Lat. Am.* 23, 619-620.
23. Birnbaumer, L. (1973) "Hormone-sensitive Adenylyl Cyclases: Useful Models for Studying Hormone Receptor Functions in Cell-free Systems." *Biochim. Biophys. Acta (Reviews on Biomembranes)* 300, 129-158.
24. Birnbaumer, L. and Yang, P.-Ch. (1974) "Studies on Receptor-mediated Activation of Adenylyl Cyclases. I. Preparation and Description of General Properties of an Adenylyl Cyclase System in Beef Renal Medullary Membranes Sensitive to Neurohypophyseal Hormones." *J. Biol. Chem.* 249, 7848-7856.
25. Birnbaumer, L., Nakahara, T., and Yang, P.-Ch. (1974) "Studies on Receptor-mediated Activation of Adenylyl Cyclases. II. Nucleotide and Nucleoside Regulation of the Activities of the Beef Renal Medullary Adenylyl Cyclase and Their Stimulation by Neurohypophyseal Hormones." *J. Biol. Chem.* 249, 7857-7866.
26. Birnbaumer, L. and Yang, P.-Ch. (1974) "Studies on Receptor-mediated Activation of Adenylyl Cyclases. III. Regulation by Purine Nucleotides of the Activation of Adenylyl Cyclases from Target Organs for Prostaglandins, Luteinizing Hormone, Neurohypophyseal Hormones and Catecholamines. Tissue and Hormone-dependent Variations." *J. Biol. Chem.* 249, 7867-7873.
27. Kaumann, A. J. and Birnbaumer, L. (1974) "Studies on Receptor-mediated Activation of Adenylyl Cyclases. IV. Characteristics of the Adrenergic Receptor Coupled to Myocardial Adenylyl Cyclase. Stereospecificity for Ligands and Determination of Apparent Affinity Constants for *Beta*-Blockers." *J. Biol. Chem.* 249, 7874-7885.
28. Nakahara, T. and Birnbaumer, L. (1974) "Studies on Receptor-mediated Activation of Adenylyl Cyclases. V. Transient Kinetics of the Activation of Beef Renal Medullary Adenylyl Cyclase by Neurohypophyseal Hormones; Estimation of Apparent Rate Constants of the Receptor Hormone Interaction." *J. Biol. Chem.* 249, 7886-7891,
29. Kaumann, A. J. and Birnbaumer, L. (1974) "Prostaglandin E<sub>1</sub> Action on Sinus Pacemaker and Adenylyl Cyclase in Kitten Myocardium." *Nature* 251, 515-516.

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30. Birnbaumer, L. Yang, P. C., Hunzicker-Dunn, M., Bockaert, J., and Duran, J. M. (1976) "Adenylyl Cyclases in Ovarian Tissues. I. Homogenization and Conditions of Assay in Graafian Follicles and Corpora Lutea of Rabbits, Rats and Pigs; Regulation by ATP and Some Comparative Properties." *Endocrinol.* *99*, 163-184.
31. Hunzicker-Dunn, M. and Birnbaumer, L. (1976) "Adenylyl Cyclase in Ovarian Tissues. II. Regulation of Responsiveness to LH, FSH and PGE in the Rabbit." *Endocrinol.* *99*, 185-197.
32. Hunzicker-Dunn, M. and Birnbaumer, L. (1976) "Adenylyl Cyclase in Ovarian Tissues. III. Regulation of Responsiveness to LH, FSH and PGE in the Prepubertal, Cycling, Pregnant and Pseudopregnant Rat." *Endocrinol.* *99*, 198-210.
33. Hunzicker-Dunn, M. and Birnbaumer, L. (1976) "Adenylyl Cyclase in Ovarian Tissues. IV. Gonadotropin-induced Desensitization of the Luteal Adenylyl Cyclase Throughout Pregnancy and Pseudopregnancy in the Rabbit and the Rat." *Endocrinol.* *99*, 211-222.
34. Bockaert, J., Hunzicker-Dunn, M., and Birnbaumer, L. (1976) "Hormone-stimulated Desensitization of Hormone-dependent Adenylyl Cyclase. Dual Action of Luteinizing Hormone on Pig Graafian Follicle Membranes." *J. Biol. Chem.* *251*, 2653-2663.

**At Baylor College of Medicine 1976-1994**

35. Kaumann, A. J. and Birnbaumer, L. (1976) "Desensitization of Kitten Atria to Chronotropic, Inotropic and Adenylyl Cyclase Stimulating Effects of (-)-Isoprenaline." *Naunyn-Schmiedeberg's Arch. Pharmacol.* *293*, 199-202.
36. Kaumann, A. J., Wittman, R., Birnbaumer, L., and Hoppe, B. H. (1977) "Activation of Myocardial *beta*-Adrenoceptors by the Nitrogen-Free Low Affinity Ligand 3',4'-Dihydroxy-Methylpropiofenone (U-0521)." *Naunyn-Schmiedeberg's Arch. Pharmacol.* *296*, 217-228.
37. Garber, A. J., Entman, M. L., and Birnbaumer, L. (1978) "Cholinergic Stimulation of Skeletal Muscle Alanine and Glutamine Formation and Release. Evidence for Mediation by a Nicotinic Cholinergic Receptor and Guanosine 3', 5'-Monophosphate." *J. Biol. Chem.* *253*, 7924-7930.
38. Morris, T. M., Birnbaumer, L., and Kaumann, A. J. (1978) "High Affinity of Carazolol for *beta*-Adrenoceptors Coupled to the Adenylyl Cyclase in Ventricular Myocardium of Kitten and *Xenopus laevis*." *Naunyn-Schmiedeberg's Arch. Pharmacol.* *303*, 295-297.
39. Birnbaumer, L., Torres, H. N., Flawia, M. M., and Fricke, R. F. (1979) "Improved Methods for Determination of Guanylyl Cyclase Activity and Synthesis of [*alpha*-<sup>32</sup>P]GTP." *Anal. Biochem.* *93*, 124-133.
40. Iyengar, R., Swartz, T. L., and Birnbaumer, L. (1979) "Coupling of Glucagon Receptor to Adenylyl Cyclase: Requirement of a Receptor-related Guanyl Nucleotide Binding Site for Coupling of Receptor to Enzyme." *J. Biol. Chem.* *254*, 1119-1123.
41. Hunzicker-Dunn, M., Derda, D., Jungmann, R. A., and Birnbaumer, L. (1979) "Resensitization of the Desensitized Follicular Adenylyl Cyclase System to LH." *Endocrinol.* *104*, 1785-1793.
42. Hunzicker-Dunn, M., Day, S. L., Abramowitz, J., and Birnbaumer, L. (1979) "Ovarian Responses of Pregnant Mare Serum Gonadotropin- and Human Chorionic Gonadotropin-Primed Rats: Desensitizing, Luteolytic and Ovulatory Effects of a Single Dose of Human Chorionic Gonadotropin." *Endocrinol.* *105*, 442-451.
43. Kaumann, A. J., Morris, T. H., and Birnbaumer, L. (1979) "On the Influence of N-Isopropyl and N-Tert Butyl Substituents on the Affinity of Ligands for Sinoatrial *beta*-Adrenoceptors in Rat Atria and *beta*-Adrenoceptors Coupled to Adenylyl Cyclase in Kitten Ventricle." *Naunyn-Schmiedeberg's Arch. Pharmacol.* *307*, 1-8.

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44. Iyengar, R. and Birnbaumer, L. (1979) "Coupling of the Glucagon Receptor to Adenylyl Cyclase by GDP: Evidence for Two Levels of Regulation of Adenylyl Cyclase." *Proc. Natl. Acad. Sci. USA* *76*, 3189-3193.
45. Abramowitz, J. and Birnbaumer, L. (1979) "Effects of Trypsin, Protease Inhibitors and Ethanol on Corpus Luteum Adenylyl Cyclase." *Biol. Reprod.* *21*, 213-217.
46. Abramowitz, J. and Birnbaumer, L. (1979) "Prostaglyclin Activation of Adenylyl Cyclase in Rabbit Corpus Luteum Membranes: Comparison with 6-Keto Prostaglandin F<sub>1 $\alpha$</sub>  and prostaglandin E<sub>1</sub>." *Biol. Reprod.* *21*, 609-616.
47. Abramowitz, J., Iyengar, R., and Birnbaumer, L. (1979) "Review: Guanyl Nucleotide Regulation of Hormonally-Responsive Adenylyl Cyclases." *Mol. Cell. Endocrinol.* *16*, 129-146.
48. Day, S. L. and Birnbaumer, L. (1980) "The Effect of Estradiol on Hormonally Stimulable Adenylyl Cyclase Activity and on Progesterone Production in Normal and Regressing Corpora Lutea from Control and hCG-treated Pseudopregnant Rabbits." *Endocrinol.* *106*, 375-381.
49. Day, S. L. and Birnbaumer, L. (1980) "Corpus Luteum Function and Adenylyl Cyclase Stimulability in the Rat After an Estradiol Benzoate-induced Ovulatory Surge of Luteinizing Hormone: Role of Prolactin." *Endocrinol.* *106*, 382-389.
50. Bearer, C. F., Swartz, T. L., Knapp, R. D., Kaumann, A. J., and Birnbaumer, L. (1980) "Iodoxybenzylpindolol: Preparation, Purification, Localization of its Iodine to the Indole Ring and Characterization as a Partial Agonist." *Mol. Pharmacol.* *17*, 328-338.
51. Garber, A. J., Entman, M. L., Birnbaumer, L. Bornet, E. P., and Thompson, W. J. (1980) "Skeletal Muscle Protein and Amino Acid Metabolism in Hereditary Mouse Muscular Dystrophy: II. The Role of Disordered Cyclic Nucleotide Metabolism in the Accelerated Alanine and Glutamine Formation and Release." *J. Biol. Chem.* *255*, 8325-8333.
52. Day, S. L., Kirchick, H. J., and Birnbaumer, L. (1980) "Effect of Prolactin on Luteal Function in the Cyclic Rat. Positive Correlation between LH-stimulability of Adenylyl Cyclase and Progesterone Secretion: Role in Corpus Luteum Rescue of the AM Surge of Prolactin on Diestrus-2." *Endocrinol.* *106*, 1265-1269.
53. Birnbaumer, L., Swartz, T. L., Abramowitz, J., Mintz, P. W., and Iyengar, R. (1980) "Transient and Steady State Kinetics of the Interaction of Guanyl Nucleotides with the Adenylyl Cyclase System from Rat Liver Plasma Membranes. Interpretation in Terms of a Simple Two-State Model." *J. Biol. Chem.* *255*, 3542-3551.
54. Birnbaumer, L., Bearer, C. F., and Iyengar, R. (1980) "A Two-State Model of an Enzyme with an Allosteric Regulatory Site Capable of Metabolizing the Regulatory Ligand: Simplified Mathematical Treatments of Transient and Steady State Kinetics of an Activator and its Competitive Inhibition as Applied to Adenylyl Cyclases." *J. Biol. Chem.* *255*, 3552-3557.
55. Iyengar, R., Abramowitz, J., Bordelon-Riser, M. E., and Birnbaumer, L. (1980) "Hormone Receptor-mediated Stimulation of Adenylyl Cyclase Systems: Nucleotide Effects and Analysis in Terms of a Two-State Model for the Basic Receptor-affected Enzyme." *J. Biol. Chem.* *255*, 3558-3564.
56. Day, S. L., Abramowitz, J., Kirchick, H. J., and Birnbaumer, L. (1980) "The Effect of Estradiol Withdrawal on Luteal Hormone-sensitive Adenylyl Cyclase and Luteal Function in the Pseudopregnant Rabbit." *Biol. Reprod.* *22*, 791-797.
57. Abramowitz, J., Iyengar, R., and Birnbaumer, L. (1980) "On the Mode of Action of Catecholamines on the Turkey Erythrocyte Adenylyl Cyclase. Evaluation of Basic Activity States After Removal of Endogenous GDP and Interpretation of Nucleotide Regulation and Hormone Activation in Terms of a Two State Model." *J. Biol. Chem.* *255*, 8259-8265.

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58. Bhat, M. K., Iyengar, R., Abramowitz, J., Bordelon-Riser, M. E., and Birnbaumer, L. (1980) "Naturally Soluble Component(s) That Confer(s) Guanine Nucleotide and Fluoride Sensitivity to Adenylyl Cyclase." *Proc. Natl. Acad. Sci. USA* *77*, 3836-3840.
59. Iyengar, R., Abramowitz, J., Bordelon-Riser, M. E., Blume, A. J., and Birnbaumer, L. (1980) "Regulation of Hormone-Receptor Coupling to Adenylyl Cyclases: Effects of GTP and GDP." *J. Biol. Chem.* *255*, 10312-10321.
60. Jahnsen, T., Purvis, K., Birnbaumer, L., and Hansson, V. (1980) "FSH and LH/hCG Responsive Adenylyl Cyclases in Adult Rat Testes: Methodology and Assay Conditions." *Int. J. Androl.* *3*, 396-416.
61. Iyengar, R., Mintz, P. W., Swartz, T. L., and Birnbaumer, L. (1980) "Divalent Cation-Induced Desensitization of Glucagon Stimulable Adenylyl Cyclase in Rat Liver Plasma Membranes. GTP-dependent Stimulation by Glucagon." *J. Biol. Chem.* *255*, 11875-11882.
62. Hansson, V., Jahnsen, T., Purvis, K., Andersen, D., and Birnbaumer, L. (1980) "LH/hCG Responsive Adenylyl Cyclase in Rat Testis and Testes from Testicular Feminized Male (tmf) Rats and Mice: Desensitization by Homologous Hormone." *Int. J. Androl.* *3*, 703-712.
63. Ezrailson, E. G., Garber, A. J., Munson, P. J., Swartz, T. L., Birnbaumer, L., and Entman, M. L. (1981) "[<sup>125</sup>I]Iodopindolol: A New *beta*-Adrenergic Receptor Probe." *J. Cycl. Nucl. Res.* *7*, 13-26.
64. Kirchick, H. J. and Birnbaumer, L. (1981) "Prostaglandins Do Not Appear to Play a Role in hCG-Induced Regression or Desensitization of Rabbit Corpora Lutea." *Biol. Reprod.* *24*, 1006-1012.
65. Iyengar, R., Bhat, M. K., Riser, M. E., and Birnbaumer, L. (1981) "Receptor-Specific Desensitization of the S49 Lymphoma Cell Adenylyl Cyclase: Unaltered Behavior of the Regulatory Component." *J. Biol. Chem.* *256*, 4810-4815.
66. Hunzicker-Dunn, M. and Birnbaumer, L. (1981) "Studies on the Mechanism of Luteinizing Hormone-induced Desensitization of the Rabbit Follicular Adenylyl Cyclase System *in vitro*." *Endocrinol.* *109*, 345-351.
67. Van Sickle, M., Oberwetter, J. M., Birnbaumer, L., and Means, A. R. (1981) "Developmental Changes in the Hormonal Regulation of Rat Testis Sertoli Cell Adenylyl Cyclase." *Endocrinol.* *109*, 1270-1280.
68. Iyengar, R. and Birnbaumer, L. (1981) "Hysteretic Activation of Adenylyl Cyclases. I. Effect of Mg Ion on the Rate of Activation by Guanine Nucleotides and Fluoride." *J. Biol. Chem.* *256*, 11036-11041.
69. Kirchick, H. J. and Birnbaumer, L. (1981) "Effects of Withdrawal of Exogenous Estradiol Supply from Pseudopregnant Rabbits: Transient Nature of Loss of Luteal Function and Reversal of Estradiol-Induced Suppression of LH-Responsive Adenylyl Cyclase." *Endocrinol.* *109*, 2129-2137.
70. Abramowitz, J., Iyengar, R., and Birnbaumer, L. (1982) "Guanine Nucleotide and Mg Ion Regulation of the Interaction of Gonadotropic and *beta*-Adrenergic Receptors with their Hormones. A Comparative Study Using a Single Membrane System." *Endocrinol.* *110*, 336-346.
71. Abramowitz, J. and Birnbaumer, L. (1982) "Properties of the Hormonally Responsive Rabbit Luteal Adenylyl Cyclase: Effects of Guanine Nucleotides and Mg Ion on Stimulation by Gonadotropin and Catecholamines." *Endocrinol.* *110*, 773-781.
72. Abramowitz, J. and Birnbaumer, L. (1982) "Temporal Characteristics of Gonadotropin Interaction with Its Receptors and Activation of Adenylyl Cyclase in the Corpus Luteum. Comparison to the Mode of Action of Catecholamines." *Endocrinol.* *111*, 970-976.
73. Iyengar, R. and Birnbaumer, L. (1982) "Hormone Receptor Modulates the Regulatory Component of Adenylyl

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- Cyclases by Reducing its Requirement for Mg Ion and Enhancing its Extent of Activation by Guanine Nucleotides." Proc. Natl. Acad. Sci. USA 79, 5179-5183.
74. Hildebrandt, J. D., Hanoune, J., and Birnbaumer, L. (1982) "Guanine Nucleotide Inhibition of *cyc* S49 Mouse Lymphoma Cell Membrane Adenylyl Cyclase." J. Biol. Chem. 257, 14723-14725.
  75. Birnbaumer, L., Swartz, T. L., Rojas, F. J., and Garber, A. J. (1983) "Synthesis, Purification by HPLC and Characterization of Monoiodoglucagon Labeled with Carrier-Free <sup>125</sup>I: Use as a Glucagon Receptor Probe." J. Recept. Res. 3, 3-20.
  76. Codina, J., Hildebrandt, J. D., Iyengar, R., Birnbaumer, L., Sekura, R. D., and Manclark, C. R. (1983) "Pertussis Toxin Substrate, the Putative N<sub>i</sub> of Adenylyl Cyclases, is an alpha/beta Heterodimer Regulated by Guanine Nucleotide and Magnesium." Proc. Natl. Acad. Sci. USA 80, 4276-4280.
  77. Hildebrandt, J. D., Sekura, R. D., Codina, J., Iyengar, R., Manclark, C. R., and Birnbaumer, L. (1983) "Stimulation and Inhibition of Adenylyl Cyclases is Mediated by Distinct Proteins." Nature 302, 706-709.
  78. Rojas, F. J., Swartz, R. L., Iyengar, R., Garber, A. J., and Birnbaumer, L. (1983) "Monoiodoglucagon: Synthesis, Purification by High Pressure Liquid Chromatography and Characteristics as a Receptor Probe." Endocrinol. 113, 711-719.
  79. Moretti-Rojas, I., Ezrailson, E. G., Birnbaumer, L., Entman, M. L., and Garber, A. J. (1983) "Serotonergic and Adrenergic Regulation of Skeletal Muscle Metabolism in the Rat. II. Use of [<sup>125</sup>I]Iodolysergic Acid Diethylamide and [<sup>125</sup>I]-Iodopindolol as Probes of Sarcolemmal Receptor Function and Specificity." J. Biol. Chem. 258, 12499-12508.
  80. Kirchick, H. J. and Birnbaumer, L. (1983) "Effects of Estradiol Treatment on Rabbit Luteal Adenylyl Cyclase: Loss of Luteinizing Hormone Receptors and Attenuation of the Regulatory N Component Activity." Endocrinol. 113, 1629-1637.
  81. Kirchick, H. J., Iyengar, R., and Birnbaumer, L. (1983) "Human Chorionic Gonadotropin-Induced Heterologous Desensitization of Adenylyl Cyclase from Highly Luteinized Rat Ovaries: Attenuation of Regulatory N Component Activity." Endocrinol. 113, 1638-1646.
  82. Birnbaumer, L., Desmier, M., Stengel, D., and Hanoune, J. (1983) "Forskolin Regulation of Liver Membrane Adenylyl Cyclase." Eur. J. Biochem. 136, 107-112.
  83. Kirchick, H. J. and Birnbaumer, L. (1983) "Luteal Adenylyl Cyclase does not Develop Sensitivity to Desensitization by hCG in the Absence of Non-Luteal Ovarian Tissue." Endocrinol. 113, 2052-2057.
  84. Hildebrandt, J. D. and Birnbaumer, L. (1983) "Inhibitory Regulation of Adenylyl Cyclase in the Absence of Stimulatory Regulation. Requirements and Kinetics of Guanine Nucleotide induced Inhibition of the *cyc* S49 Adenylyl Cyclase." J. Biol. Chem. 258, 13141-13147.
  85. Hildebrandt, J. D., Codina, J., Risinger, R., and Birnbaumer, L. (1984) "Identification of a *gamma* Subunit Associated with the Adenylyl Cyclase Regulatory Proteins N<sub>s</sub> and N<sub>i</sub>." J. Biol. Chem. 259, 2039-2042.
  86. Codina, J., Hildebrandt, J. D., Sekura, R. D., Birnbaumer, M., Bryan, J., Manclark, C. R., Iyengar, R., and Birnbaumer, L. (1984) "N<sub>s</sub> and N<sub>i</sub>, the Stimulatory and Inhibitory Regulatory Components of Adenylyl Cyclases. Purification of the Human Erythrocyte Proteins Without the Use of Activating Regulatory Ligands." J. Biol. Chem. 259, 5871-5886.
  87. Dighe, R. R., Rojas, F. J., Birnbaumer, L. and Garber, A. J. (1984) "The Glucagon-Stimulable Adenylyl Cyclase System in Rat Liver: Effects of Uremia and Intermittent Glucagon Administration." J. Clin. Invest. 73, 1004-1012.

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88. Dighe, R. R., Rojas, F. J., Birnbaumer, L. and Garber, A. J. (1984) "The Impact of Streptozotocin-Induced Diabetes Mellitus on the Glucagon-Stimulable Adenylyl Cyclase System in Rat Liver." *J. Clin. Invest.* **73**, 1013-1023.
89. Cerione, R. A., Sibley, D. R., Codina, J., Benovic, J. L., Winslow, J., Neer, E. J., Birnbaumer, L., Caron, M. G., and Lefkowitz, R. J. (1984) "Reconstitution of a Hormone-Sensitive Adenylate Cyclase System: The Pure *beta*-Adrenergic Receptor and Guanine Nucleotide Regulatory Protein Confer Hormone Responsiveness to the Resolved Catalytic Unit." *J. Biol. Chem.* **259**, 9979-9982.
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