BIOGRAPHICAL SKETCH

Provide the following information for the key personnel in the order listed on Form Page 2.
Follow this format for each person. **DO NOT EXCEED FOUR PAGES.**

NAME	POSITION TITLE
Ken D. McCarthy, Ph.D.	Professor

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, and include postdoctoral training.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	YEAR(s)	FIELD OF STUDY
California State University at Fullerton	B.A.	1971	Biology
University of Utah	Ph.D.	1975	Pharmacology

A. Positions and Honors:

Research and/or Professional Experience

1975 -1978 U.S.P.H.S. Fellow, Division of Developmental Biology, University of California, Los Angeles
1979 -1984 Assistant Professor, Department of Pharmacology, University of North Carolina at Chapel Hill, Chapel Hill, NC
1985 - 1990 Associate Professor, Department of Pharmacology, University of North Carolina at Chapel Hill, Chapel Hill, NC
1990 - Professor, Department of Pharmacology, University of North Carolina at Chapel Hill, Chapel Hill, NC

Professional Service

1985 –1986 NIH Study Section, Neurobiology 2; Adhoc Member
1986 -1987 NIH Study Section, Neurobiology 2; Member
1987 – 1991 NIH Study Section, Neurological Science 2; Member
1987 - 1988 Program Committee member for 1988 and 1989 Winter Conference on Brain Research
1988 NIH Site Visit - Baltimore, MD.
1989 Symposium Organizer, Tissue Culture Association, entitled "In Vitro Models for Evaluating Mechanisms of Neurotoxicity".
1992 Program Chairman for 1993 American Society for Neurochemistry
1992 Premeeting Workshop Co-organizer for 1993 ASN Meeting entitled "Knockout Strategies In Molecular Neurobiology"
2004 NIH Study Section, Neurodegeneration and Biology of Glia; Member

B. Selected peer-reviewed publications:

McCarthy KD and de Vellis J. -Adrenergic receptor modulation of -adrenergic, adenosine and PGE1 increased adenosine 3':5'-cyclic monophosphate levels in primary cultures of glia. J.Cyclic Nuc.Res. 4: 15-26, 1978.

McCarthy KD and de Vellis J. Preparation of separate astroglial and oligodendroglial cell cultures. J.Cell Biol. 85: 890-902, 1980.

McCarthy KD. An autoradiographic analysis of -adrenergic receptors on immunocytochemically defined astroglia. J.Pharmacol.Exp.Ther. 226: 282-290, 1983.

Ingraham C and McCarthy KD. Plasticity of process-bearing glial cell cultures from neonatal rat cerebral cortical tissues. J.Neurosci. 9:63-69,1989.

Lerea L and McCarthy KD. Astroglial cells in vitro are heterogeneous with respect to expression of the alpha1-adrenergic receptor. Glia 2:135-147, 1989.

Salm AK and McCarthy KD. Expression of β-adrenergic receptors by astrocytes isolated from adult rat cortices. Glia 2: 346-352, 1989.

Brooks RC, McCarthy KD and Morell P. Receptor-stimulated phospholipase α_2 activation is coupled to influx of external calcium and not to mobilization of intracellular calcium in C62B glioma cells. J.Biol.Chem. 264: 20147-20153, 1989.

Lerea LS and McCarthy KD. Neuron-associated astroglial cells express β- and α_1-adrenergic receptors *in vitro*. Brain Res. 521:7-14, 1990.

Salm AK and McCarthy KD. Norepinephrine-evoked calcium transients in cyltured type 1 astroglia. Glia 3:529-538, 1990.

McCarthy KD and Salm AK. Pharmacologically distinct subsets of astrocytes identified by their calcium response to neuroligands. Neurosci. 41: 325-333, 1990.

Enkvist MOK and McCarthy KD. Activation of protein kinase C blocks astroglial gap junction communication and inhibits the spread of calcium waves. J.Neurochem. 59:519-526, 1992.

Shao Y and McCarthy KD. Regulation of astroglial responsiveness to neuroligands in primary culture. Neurosci. 55:991-1001, 1993.

Shao Y and McCarthy KD. Quantitative relationship between $_1$-adrenergic receptor density and the receptor-mediated calcium response in individual astroglial cells. Mol.Pharmacol. 44:247-254, 1993.

Enkvist MOK and McCarthy KD. Astroglial gap junction communication is increased by treatment with either glutamate or high K^+ concentration. J.Neurochem. 62:489-495, 1994.

Shao YP, Enkvist MOK and McCarthy KD. Glutamate blocks astroglial stellation: Effect of glutamate uptake and volume changes. Glia 11:1-10, 1994.

Lyons S, Morrell P and McCarthy KD. Schwann cells exhibit P_{2Y} purinergic receptors that regulate intracellular calcium and are upregulated by cyclic AMP analogs. J.Neurochem. 63:552-560, 1994.

He M and McCarthy KD. Oligodendroglial signal transduction systems are developmentally regulated. J.Neurochem. 63:501-508, 1994.

Shao Y and McCarthy KD. Plasticity of astrocytes. Glia 11:147-155, 1994.

Shao Y, Porter JT and McCarthy KD. Neuroligand receptor heterogeneity among astroglia. Perspect. Dev.Neurobiol. 2:205-215, 1994.

Porter JT and McCarthy KD. GFAP-positive hippocampal astrocytes *in situ* respond to glutamatergic neuroligands with increases in $[Ca^{2+}]_i$. Glia 13: 101-112, 1995.

Shao Y and McCarthy KD. Receptor-mediated calcium signals in astroglia: multiple receptors, common stores and all-or-nothing responses. Cell Calcium 17:187-196, 1995.

Porter JT and McCarthy KD. Adenosine receptors modulate $[Ca^{2+}]_i$ in hippocampal astrocytes *in situ*. J.Neurochem. 65:1515-1523, 1995.

Giaume C and McCarthy KD. Control of gap-junctional communication in astrocytic networks. Trends Neurosci. 19:319-325, 1996.

Porter JT and McCarthy KD. Hippocampal astrocytes *in situ* respond to glutamate released from synaptic terminals. J.Neurosci. 16:5073-5081, 1996.

He M, Howe DG and McCarthy KD. Oligodendroglial signal transduction systems are regulated by neuronal contact. J.Neurochem. 67:1491-1499, 1996.

Porter JT and McCarthy KD. Astrocytic neurotransmitter receptors *in situ* and *in vivo*. Prog.Neurobiol. 51:439-455, 1997.

Shao Y and McCarthy KD. Responses of Bergmann glia and granule neurons *in situ* to N-methyl-Daspartate, norepinephrine, and high potassium. J.Neurochem. 68:2405-2411, 1997.

Howe DG and McCarthy KD. Analysis of neuron-Schwann cell interactions at the single cell level using dicisronic retroviral vectors. J. Neurosci. Methods, 83: 133-142, 1998.

Shelton MK and McCarthy KD. Mature hippocampal astrocytes exhibit functional metabotropic and ionotropic glutamate receptors *in situ*. Glia, 26(1): 1-11, 1999.

Shelton MK and McCarthy KD. Hippocampal astrocytes exhibit Ca^{2+}-elevating muscarinic cholinergic and histaminergic receptors *in situ*. J.Neurochem. 74: 555-563, 2000.

Howe DG and McCarthy KD. Retroviral inhibition of cAMP-dependent protein kinase inhibits myelination but not Schwann cell mitosis stimulated by interaction with neurons. J.Neurosci. 15: 3513-3521, 2000

Nett, WJ, Oloff SH, and McCarthy KD. Hippocampal astrocytes *in situ* exhibit calcium oscillations that occur independent of neuronal activity. 87: 528-537, 2002.Fiacco TA and McCarthy KD. Astrocytic Ca^{++}waves increase spontaneous neuronal AMPA currents. J. Neurosci. 24:722-732, 2004.

Lin, W., Kemper A, McCarthy KD, Pytel P, Wang JP, Campbell, IL, Utset MF, Popko B. Interferon-gamma induced medulloblastoma in the developing cerebellum. J Neurosci. 2004 Nov 10;24(45):10074-83

Fiacco TA, McCarthy KD. Intracellular astrocyte calcium waves in situ increase the frequency of spontaneous AMPA receptor currents in CA1 pyramidal neurons. J Neurosci. 2004 Jan 21;24(3):722-32.

Ye, P, Popken, GJ, Kemper A, McCarthy, K, Popko, B., and D'Ercole, AJ. Astrocyte-specific overexpression of insulin-like growth factor-1 promotes brain overgrowth and glial fibrillary acidic protein expression. J Neuroscience Res. 78:472-484, 2004.

Pascual, O, Casper, K, Kubera, C, Zhang, J, Revilla-Sanchez R, Sul, J-Y, Takano, H, Moss, SJ, McCarthy, KD, and Haydon, PG. Astrocyte Purinergic Signaling Coordinates Synaptic Networks, Sci, 310 (5745):113-116, 2005

Casper KB and McCarthy, KD. GFAP-positive progenitor cells produce neurons and oligodendrocytes throughout the CNS. Mol Cell Neurosci. Feb. 2006

C. Current Grant Support

NS033938-06 4/04 – 3/09
NIH
Priority Score: 2.8%
Title: Astrocyte Regulation of Neuronal Activity In Vivo
Thrust: To develop and use conditional gene knockouts to assess the role of astrocytes in regulating neuronal activity.

NS020212 12/05 – 11/09
NIH
Priority Score: 11%
Title: Neuronal-Astrocytic Communications In Vivo
Thrust: To use multiphoton imaging, patch clamp electrophysiology, caged molecules and genetically-modified mice to examine the role of astrocytes in synaptic transmission.