

# Gopal Das

1933-1991

## A Remembrance

When I close my eyes and think of Gopal Das I see him in the dimly lit Neuroanatomy teaching lab on the second floor of Lily Hall at Purdue, standing behind an overhead projector, his face eerily illuminated by the light from the vents around the projector, describing the connections of brainstem, enwrapping each concept of connectivity, cytology and cytoarchitecture in his own form of poetry, hypnotically bringing a peculiar aggregation of Latin names and obscure drawings together, creating a dynamic brain in our minds. Gopal's death in 1991 following a heart attack deprived Purdue of a talented teacher, deprived Science of a unique talent, and deprived many of us of a mentor we had suspected of being immortal. His work, of course, stands as an eternal memorial to his genius, insight, and his painstakingly systematic and straightforward approach to science. In his twenty years on the faculty of the Department of Biological Sciences at Purdue, nine of his students earned Ph.D.s, another seven received Masters degrees, numerous undergraduate students performed Honors research in his laboratory, and a score of other students asked him to serve on their graduate committees. The contributors to this volume are all, like myself, former Ph.D. students who worked under his direction.

Gopal was born in Northeastern India in 1933 and his family moved south from their ancestral home near Afghanistan in what is now Pakistan, to Bombay during the time of India's partition after the second world war. During one of several periods of adversity in my own graduate days Gopal confided the following story to me. When he showed up for the first day of school in Bombay he was asked his name by the school officials, themselves all native to the Bombay area. He gave it, a long name renowned in his homeland but ridiculed down south as being "the name for a

goat". He was given a new surname, which he kept and has been known by in scientific circles since. He advised me that one could persevere through even worse adversity than I was facing if one could achieve the right perspective. He clearly did more than persevere during his career.

He earned his Ph.D. at Boston University in 1965 under Dr. Joseph Altman and studied under Dr. Walle Nauta and many of the other forefathers of modern Neuroanatomy. He went to the Max Planck Institute in Munich, Germany to work with Georg Kreutzberg, who became one of Gopal's dearest friends. Gopal rejoined Joe Altman and moved with him as an assistant professor to the Department of Biological Sciences at Purdue in 1968. He continued collaborative work on neurogenesis but also began the pursuit of what was to become his passion and obsession, neural tissue transplantation. He told the story that as a postdoc he had a notion that it might be possible to restore damaged brain circuitry by transplanting slabs of developing brain tissue, inserting them much as one would insert an integrated circuit board into a computer. Early efforts (Das and Altman, 1971) transplanting cerebellar primordia from a <sup>3</sup>H-thymidine labeled donor to a non-labeled neonatal host taught them that nervous system repair through the use of transplants was not to be as easy as upgrading a computer's memory. This work began his characterization of the principles and properties of neural tissue transplantation, work which would become the foundation for a field of research that saw exponential growth within a decade.

He pursued transplantation in his own laboratory with his graduate students as well as his wife and assistant Kunda, working always as a team while performing surgeries. A hierarchy developed in which the most senior student was accorded the privilege of assisting with surgery, observing him

perform through the observation tube of the 'scope, and the more junior students were relegated to performing the less glamorous jobs of anesthesia, suturing, or shuttling cages between the surgery and the animal rooms. Gopal remained a "hands on" scientist for the rest of his life. Both his skill and his enthusiasm for research were clearly evident to all who worked with him. It is probably fitting that he is best remembered and most often cited for the two papers that described the promise, the potential, and the technique of transplantation (Das *et al.* 1974, 1979). During the early period in his laboratory he and his students Howard Nornes, Bill Anderson, Mike Pfaffenroth, and Pat McAllister pursued other interests including normal and abnormal nervous system development, but over time his laboratory became the transplantation laboratory. By the time I joined the group in 1978 the focus was almost exclusively on transplantation. Although his technical papers may have been more often cited, work performed during the middle era in his laboratory, defining properties of transplant growth and connectivity with Brian Hallas and Monica Oblinger, were perhaps the most important works to come out of the laboratory. These studies made clear both the potential and the limitations of the transplantation technique. This work was augmented by studies performed with John Houle on the survivability and transplantability of cryopreserved embryonic neural tissue, with Jane Brasko on the development of transplanted embryonic and postnatal tissues, and the basic survivability properties of tissues from all regions of the neuraxis, a project to which virtually every graduate student who ever passed through his laboratory contributed in some way. The later phase of Dr. Das's work, in which he was assisted by students Prashant Rai and Maureen Reidel, was characterized by an intense focus on the potential of embryonic nervous tissue for repair of spinal cord injury. Although he first performed such studies in the mid-70s, he became more and more committed to studying the problems and possible solutions to spinal cord injury as time went on. He had not turned his back, however, on his studies defining the basic properties of transplant survival and growth. Dr. Altman met Gopal about a week prior to his death and found that Gopal was very enthusiastic

about preliminary results he had obtained using amniotic fluid for enhancing the survival and differentiation of transplanted embryonic neuroblasts, most of which otherwise die following transplantation. Given the resurgence of interest in neurotrophic factors today, this observation may also prove to open another field of study, helping to bring Gopal Das's vision of replacement of damaged circuitries that much closer to reality.

Although Gopal was very serious and dignified in his bearing, he was a complex, deeply thoughtful man who also had another side that was almost whimsical. My first indication that the man may be human was when, as a young graduate student privileged to accompany him to the Anatomy meeting in New Orleans in 1981, I witnessed his smile as Dr. Jerry Bernstein bestowed a bear hug that not only engulfed him but, I feared, might have cracked several ribs as well. Although a vegetarian, he had a secret hankering for Big Macs and most of his later students dined out with him beneath the golden arches at scientific meetings. Gopal could be difficult, as all of his students can attest, and was often critical of the work of other scientists, sometimes overly so, but where his friendship ran it was deep, as his good friends and long time collaborators, including Bob Wallace and others, will attest.

He is mourned by his family: Kunda, his daughter Shonu and his son Ravi, and all his friends, and missed by many others: both those who knew of his work and those who will labor in fields where his enlightenment would have continued to lead the way. On rare occasions Gopal would find sources of inspiration and gems of wisdom from the most unlikely places and share them with his students. He was an avid fan of the old Dick Van Dyke show and his favorite episode was one in which the character Rosemarie related an incident, acted out by the characters of the show, which afterwards was remembered differently by everyone else involved. She allowed that some of the others may have more accurately portrayed the events which took place, but that since she was the one that got to write the story, hers would be the truth others would remember. Gopal's version of the truth will survive him in his scientific writings, a tale that will be worth reading for a long time to come. The best

tribute we, his former students, can make to him is our own work, using the gifts and talents that he helped nurture. I am sure he would have told it differently, but the telling of the tale was left to me. I miss him, think of him often, and will remember him always.

### PROSPERO, O PROSPERO

The riddle shall lead through maze of all choice  
 patterning answers from symbols unsaid,  
 released from the night within the small voice  
 "What stays behind now yet goes on ahead?"  
 My puzzle I keep, I preach not its way,  
 learners may find ways unknown to me still,  
 far be it from me to decide and say  
 "So shall it be" and impose thus my will;  
 For I remember the tales I've been told,  
 their echoes still sound "There's more to the truth"  
 than rumors I've heard that some day we'll hold  
 volumes we'll value much more than our youth;  
 Cast from deepest truths these tales may show  
 humors by which our selves we'll know.

Douglas T. Ross, Ph.D.  
 6 September 1994

### STUDENTS RECEIVING DEGREES UNDER PROFESSOR GOPAL D. DAS

B.S. Honors Theses	Date
Gordon Greenman	1973
Bradley Black	1973
Mark Harshman	1973
Larry Berte	1973
Patricia Kotylo	1975
Gayle Winters	1975
Rita Huff	1976
Manfred Muller	1978
Mary K. Hill	1981
Jose Aleman-Gomez	1983
Angel Hernandez	1991
Cynthia Huan	1992

Masters Theses	Date
Gary Lammert	1973
Brian H. Hallas	1976
John D. Houlé	1977
Monica M. Oblinger	1978
Andrew Della-Colletta	1980
Jane Brasko	1981
Cheryl M. Chanaud	1984

Ph.D. Dissertations	Date
William J. Anderson	1974
Howard O. Nornes	1975
James P. McAllister III	1976
Michael J. Pfaffenroth	1977
Brian H. Hallas	1979
John D. Houlé	1981
Monica M. Oblinger	1981
Douglas T. Ross	1983
Maureen Reidl	1991
Prashant Rai	1992
Jane Brasko	1993

**A CHRONOLOGICAL BIBLIOGRAPHY  
OF GOPAL D. DAS**

**1964**

- Altman JA, Das GD. Autoradiographic and histological investigation of changes in the visual system of rats after unilateral enucleation. *Anat Rec* 1964; 148: 535-545.
- Altman JA, Das GD. Autoradiographic examination of the effects of enriched environment on the rate of glial multiplication in the adult rat brain. *Nature* 1964; 204: 1161-1163.

**1965**

- Altman JA, Das GD. Autoradiographic and histological evidence of postnatal hippocampal neurogenesis in rats. *J Comp Neurol* 1965; 124: 319-336.
- Altman JA, Das GD. Postnatal origins of microneurons in the rat brain. *Nature* 1965; 207: 953-956.

**1966**

- Altman JA, Das GD. Autoradiographic and histological studies of postnatal neurogenesis I. A longitudinal investigation of the kinetics, migration and transformation of cells incorporating tritiated thymidine in neonate rats with special reference to postnatal neurogenesis in some brain regions. *J Comp Neurol* 1966; 126: 337-390.
- Altman JA, Das GD. Behavioral manipulations and protein metabolism of the brain: I. Effects of motor exercise on the utilization of leucine- $H^3$ . *Physiol Behav* 1966; 1: 105-108.
- Das GD, Altman JA. Behavioral manipulations and protein metabolism of the brain: II. Effects of restricted and enriched environments on the utilization of leucine- $H^3$ . *Physiol Behav* 1966; 1: 109-110.
- Altman JA, Das GD, Chang J. Behavioral manipulations and protein metabolism of the brain: III. Effects of visual training on the utilization of leucine- $H^3$ . *Physiol Behav* 1966; 1: 111-115.

**1967**

- Das GD, Kreutzberg GW. Postnatal differentiation of the granule cells in the hippocampus and cerebellum: a histochemical study. *Histochemie* 1967; 10: 246-260.
- Altman JA, Das GD. Postnatal neurogenesis in the guinea pig. *Nature* 1967; 214: 1098-1101.

**1968**

- Das GD, Kreutzberg GW. Evaluation of interstitial nerve cells in the central nervous system. A correlative study using acetylcholinesterase and Golgi techniques. *Ergeb Anat Entw* 1968; 41: 1-69.
- Altman JA, Das GD, Anderson WJ. Effects of infantile handling on the morphological development of the rat brain: an exploratory study. *Dev Psychobiol* 1968; 1: 10-20.
- Altman JA, Wallace RB, Anderson WJ, Das GD. Behaviorally induced changes in the length of cerebrum in rats. *Dev Psychobiol* 1968; 1: 112-117.

**1969**

- Wallace RB, Altman JA, Das GD. An autoradiographic and morphological investigation of the postnatal development of the pineal body. *Am J Anat* 1969; 126: 175-184.

**1970**

- Das GD. An evaluation of the interstitial nerve cells in the cerebellum. *Z Anat Entw* 1970; 131: 283-290.
- Das GD, Altman JA. Postnatal neurogenesis in the caudate nucleus and nucleus accumbens septi in the rat. *Brain Res* 1970; 21: 122-127.
- Altman JA, Das GD. Postnatal changes in the concentration and distribution of cholinesterase in the cerebellar cortex of rats. *Exp Neurol* 1970; 28: 11-34.

**1971**

- Das GD. Projections of the interstitial nerve cells surrounding the globus pallidus: A study of retrograde changes following cortical ablations in rabbits. *Z Anat Entw* 1971; 133: 135-160.
- Das GD. Experimental studies on the postnatal development of the brain. I. Cytogenesis and morphogenesis of the accessory fascia dentata following hippocampal lesions. *Brain Research* 1971; 28: 263-282.
- Das GD. Premature cessation of neurogenesis and gliogenesis in rats showing runting syndrome. *Virchows Arch Abt B Zellpath* 1971; 9: 58-74.
- Das GD, Altman J. Postnatal neurogenesis in the cerebellum of the cat and tritiated thymidine autoradiography. I. The external granule cell layer and the transitional molecular layer. *Brain Res* 1971; 30: 323-330.
- Das GD, Altman J. The fate of transplanted precursors of nerve cells in the cerebellum of young rats. *Science* 1971; 173: 637-638.
- Altman JA, Das GD, Sudarshan K. The influence of nutrition on neural and behavioral development. I.

Critical review on some data on the growth of the body and the brain following dietary deprivation during gestation and lactation. *Dev Psychobiol* 1971; 3: 281-301.

Altman JA, Das GD, Sudarshan K, Anderson WJ. The influence of nutrition on neural and behavioral development. II. Growth of body and brain using different techniques of undernutrition. *Dev Psychobiol* 1971; 4: 55-70.

Altman JA, Sudarshan K, Das GD, McCormick N, Barnes D. The influence of nutrition on neural and behavioral development. III. Development of some motor, particularly locomotion, patterns during infancy. *Dev Psychobiol* 1971; 4: 97-114.

### 1972

Das GD, Altman J. Studies on the transplantation of developing neural tissue in the mammalian brain. I. Transplantation of cerebellar slabs into the cerebellum of neonate rats. *Brain Res* 1972; 38: 233-249.

Das GD. Influences of the pia mater on the precursors of nerve cells. *Z Anat Entwickl-Gesch* 1972; 138: 227-240.

Das GD, Hine RJ. Nature and significance of spontaneous degeneration of axons in the pyramidal tract. *Z Anat Entwickl-Gesch* 1972; 136: 98-114.

Das GD, Nornes HO. Neurogenesis in the cerebellum of the rat: An autoradiographic study. *Z Anat Entwickl-Gesch* 1972; 138: 155-165.

Das GD, Pfaffenroth M. Effects of ethyl-nitrosourea on the development of the brain. *Experientia* 1972; 28: 1076-1077.

Nornes HO, Das GD. Temporal pattern of neurogenesis in spinal cord: Cytoarchitecture and directed growth of axons. *Proc Natl Acad Sci USA* 1972; 69: 1962-1966.

### 1973

Das GD. Transplantation of cerebellar tissue in the cerebellum of neonate rabbits. *Brain Res* 1973; 50: 170-173.

Das GD, Nornes HO, Hine RJ, Pfaffenroth MJ. Experimental studies on the postnatal development of the brain. II. Cytoarchitectural regeneration in the developing cerebellum of the rabbit. *T-I-T J Life Sci* 1973; 3: 29-65.

Das GD, Nornes HO, Hine RJ, Pfaffenroth MJ. Experimental studies on the postnatal development of the brain. II. Cytoarchitectural regeneration in the developing cerebellum of the rabbit. *T-I-T J Life Sci* 1973; 3: 29-65.

### 1974

Das GD. Transplantation of embryonic neural tissue in the mammalian brain. I. Growth and differentiation of neuroblasts from various regions of the embryonic brain in the cerebellum of neonate rat. *T-I-T J Life Sci* 1974; 4: 93-124.

Das GD, Lammert GL, McAllister JP. Contact guidance and migratory cells in the developing cerebellum. *Brain Res* 1974; 69: 13-29.

Hine RJ, Das GD. Neuroembryogenesis in the hippocampal formation of the rat. An autoradiographic study. *Z Anat Entwickl-Gesch* 1974; 144: 173-186.

Nornes HO, Das GD. Temporal pattern of neurogenesis in spinal cord of rat. I. An autoradiographic study – Time and sites of origin and migration and settling patterns of neuroblasts. *Brain Res* 1974; 73: 121-138.

Pfaffenroth MJ, Das GD. Heterotopic cell nests in the developing rat cerebellum. *Acta Neuropathol* 1974; 30: 1-9.

Pfaffenroth MJ, Das GD, McAllister JP. Teratologic effects of ethyl-nitrosourea on brain development in rats. *Teratology* 1974; 9: 305-316.

### 1975

Das GD. Transient cytoplasmic bridges among cells of developing cerebellum: A possible mode of induction for cell differentiation. *Cell Differentiation* 1975; 3: 371-377.

Das GD. Differentiation of dendrites in the transplanted neuroblasts in the mammalian brain. In: Kreutzberg GW, ed, *Advances in Neurology: Physiology and Pathology of Dendrites*, Vol. 12. New York: Raven Press, 1975; pp. 181-199.

### 1976

Das GD. Resting and reactive macrophages in the developing cerebellum: An experimental ultrastructural study. *Virchows Archiv B Cell Pathology* 1976; 20: 287-298.

Das GD. Gitter cells and their relationship to macrophages in the developing cerebellum: An electron microscopic study. *Virchows Archiv B Cell Pathology* 1976; 20: 299-305.

Das GD. Differentiation of Bergmann glia cells in the cerebellum: A Golgi study. *Brain Res* 1976; 110: 199-213.

Das GD, Pfaffenroth MJ. A further note on the presence of the endogenous macrophages in the developing cerebellum. *Virchows Archiv B Cell Pathology* 1976; 22: 299-304.

## 1977

- Das GD. Membrane-fusions and cytoplasmic bridges in the cells of the developing cerebellum. *Cell Tissue Res* 1977; 176: 475-492.
- Das GD. Gliogenesis during embryonic development of the rat. *Experientia* 1977; 33: 1648-1649.
- Das GD. Experimental analysis of embryogenesis of cerebellum in rat. I. Subnormal growth following X-ray irradiation on day 15 of gestation. *J Comp Neurol* 1977; 176: 419-434.
- Das GD. Experimental analysis of embryogenesis of cerebellum in rat. II. Morphogenetic malformations following X-ray irradiation on day 18 of gestation. *J Comp Neurol* 1977; 176: 435-452.
- Das GD. Induction of mitosis in the differentiating Purkinje cells of the cerebellum. *Acta Anatomica* 1977; 97: 435-442.
- Das GD. Binucleated neurons in the central nervous system of the laboratory animals. *Experientia* 1977; 33: 1179-1180.
- Das GD, Pfaffenroth MJ. Experimental studies on the postnatal development of the brain. III. Cerebellar development following localized administration of ENU. *Neuropathology and Applied Neuro-biology* 1977; 3: 191-212.
- McAllister JP, Das GD. Neurogenesis in the epithalamus, dorsal thalamus and ventral thalamus of the rat: An autoradiographic and cytological study. *J Comp Neurol* 1977; 172: 647-686.

## 1978

- Das GD. Premature death of Purkinje cells following low-level X-ray irradiation during embryonic development. *Acta Anatomica* 1978; 101: 225-233.
- Das GD, Hallas BH. Transplantation of brain tissue in the brain of the adult rat. *Experientia* 1978; 34: 1304-1306.
- Hallas BH, Das GD. N-Ethyl-N-nitrosourea-induced teratogenesis in the brain in the rat. *J Neurol Sci* 1978; 39: 111-122.
- Morre DM, Kirksey A, Das GD. Effects of vitamin B<sub>6</sub> deficiency on the developing central nervous system of the rat. Gross measurements and cytoarchitectural alterations. *J Nutr* 1978; 108: 1250-1259.
- Morre DM, Kirksey A, Das GD. Effects of vitamin B<sub>6</sub> deficiency on the developing central nervous system of the rat. Myelination. *J Nutr* 1978; 108: 1260-1265.

## 1979

- Das GD. Gliogenesis and ependymogenesis during embryonic development of the rat. An autoradiographic study. *J Neurol Sci* 1979; 43: 193-204.

- Das GD, Hallas BH, Das KG. Transplantation of neural tissues in the brain of laboratory mammals: Technical details and comments. *Experientia* 1979; 35: 143-153.
- Hallas BH, Das GD. An aberrant nucleus in the telencephalon following administration of ENU during neuroembryogenesis. *Teratology* 1979; 19: 159-164.
- Pfaffenroth MJ, Das GD. N-Ethyl-N-nitrosourea-induced spinal tumors in an inbred strain of W-albino rats. *J Natl Cancer Inst* 1979; 63: 647-650.

## 1980

- Das GD, Hallas BH, Das KG. Transplantation of brain tissue in the brain of rat. I. Growth characteristics of transplants from embryos of different ages. *Am J Anat* 1980; 158: 135-145.
- Hallas BH, Das GD, Das KG. Transplantation of brain tissue in the brain of rat. II. Growth characteristics of transplants in the hosts of different ages. *Am J Anat* 1980; 158: 147-159.
- Hallas BH, Oblinger MM, Das GD. Heterotopic neural transplants in the cerebellum of the rat: Their afferents. *Brain Res* 1980; 196: 242-246.
- Houlé JD, Das GD. Freezing and transplantation of brain tissue in rats. *Experientia* 1980; 36: 1114-1115.
- Houlé JD, Das GD. Freezing of embryonic neural tissue and its transplantation in the rat brain. *Brain Res* 1980; 192: 570-574.
- Oblinger MM, Hallas BH, Das GD. Neocortical transplants in the cerebellum of the rat: Their afferents and efferents. *Brain Res* 1980; 189: 228-232.

## 1981

- Oblinger MM, Das GD. Neurogenesis in the brain stem of the rabbit. An autoradiographic study. *J Comp Neurol* 1981; 197: 45-62.

## 1982

- Das GD. Extraparenchymal neural transplants: Their cytology and survivability. *Brain Res* 1982; 241: 182-186.
- Das GD, Ross DT. Stereotaxic technique for transplantation of neural tissues in the brain of adult rats. *Experientia* 1982; 38: 848-851.
- Oblinger MM, Das GD. Connectivity of neural transplants in adult rats: Analysis of afferents and efferents of neocortical transplants in the cerebellar hemisphere. *Brain Res* 1982; 249: 31-49.
- Wallace RB, Das GD. Behavioral effects of CNS transplants in the rat. *Brain Res* 1982; 243: 133-139.

## 1983

- Das GD. Neural transplantation in the spinal cord of the adult mammals. In: Kao CC, Bunge RP, eds, *Reconstruction of the Spinal Cord*. New York: Raven Press, 1983; pp. 367-396.
- Das GD, Houlé JD, Brasko J, Das KG. Freezing of neural tissues and their transplantation in the brain of the rat: Technical details and histological observations. *J Neurosci Meth* 1983; 8: 1-15.
- Das GD. Neural transplantation in mammalian brain: Some conceptual and technical considerations. In: Wallace RB, Das GD, eds, *Neural Tissue Transplantation Research*. Berlin-Heidelberg-New York: Springer-Verlag, 1983; pp. 1-64.
- Das GD. Neural transplantation in the spinal cord of the adult rats: Conditions, survival, cytology and connectivity of the transplants. *J Neurol Sci* 1983; 62: 191-210.
- Das GD, Das KG, Brasko J, Aleman-Gomez J. Neural transplants: Volumetric analysis of their growth and histopathological changes. *Neurosci Lett* 1983; 41: 73-79.
- Albert EN, Das GD. Neocortical transplants in the rat brain: An ultrastructural study. *Experientia* 1983; 4: 294-298.
- Houlé JD, Das GD. Permanent alterations in the rat spinal cord following prenatal exposure to N-ethyl-N-nitrosourea. *Brain Res Bull* 1983; 10: 839-845.
- Oblinger MM, Das GD. Connectivity of neural transplants in the cerebellum: A model of developmental differences in neuroplasticity. In: Wallace RB, Das GD, eds, *Neural Tissue Transplantation Research*. New York: Springer-Verlag, 1983; pp. 105-134.

## 1984

- Das GD. Neural transplantation in the spinal cord and its functional significance. In: Rossier A, Radaelli E, Radaelli T, eds, *Paraplegia and Tetraplegia*. Milan, Italy: Libreria Scientifica gia GHEDINI s.r.l., 1984; pp. 23-54.
- Houlé JD, Das GD. Tissue repair in the embryonic spinal cord following exposure to N-ethyl-N-nitrosourea. *Int J Dev Neurosci* 1984; 2: 1-11.

## 1985

- Das GD. Intraparenchymal transplantation. In: Björklund A, Stenevi U, eds, *Neural Grafting in the Mammalian CNS*. Amsterdam: Elsevier, 1985; pp. 23-30.
- Das GD. Development of neocortical transplants. In: Björklund A, Stenevi U, eds, *Neural Grafting in the Mammalian CNS*. Amsterdam: Elsevier, 1985; pp. 101-123.

## 1986

- Das GD. Histopathology of neural transplants and host brain. In: *Processes of Recovery from Neural Trauma*, *Exp Brain Res*, 1986; Suppl. 13: 88-106.
- Das GD. Growth and development of neural transplants: Some quantitative parameters. In: *Processes of Recovery from Neural Trauma*, *Exp Brain Res*, 1986; Suppl. 13: 333-350.
- Das GD. Neural transplantation in spinal cord under different conditions of lesions and their functional significance. In: Das GD, Wallace RB, eds, *Neural Transplantation and Regeneration*. New York: Springer-Verlag, 1986; pp. 1-66.
- Das GD, Ross DT. Neural transplantation: Autoradiographic analysis of histogenesis in neocortical transplants. *Int J Dev Neurosci* 1986; 4: 69-79.
- Ross DT, Das GD. Regenerative growth of retinofugal axons into and through neocortical transplants following transection of the optic tract in adult rats. In: Das GD, Wallace RB, eds, *Neural Transplantation and Regeneration*. New York: Springer-Verlag, 1986; pp. 181-228.

## 1987

- Das GD. Neural transplantation in normal and traumatized spinal cord. In: *Cell and Tissue Transplantation into the Adult Brain*. *Ann NY Acad Sci*, 1987; 495: 53-70.
- Chanaud CM, Das GD. Growth of neural transplants: Effects of initial volume, growth potential and fresh vs. freezing of tissues. *Neurosci Lett*, 1987; 80: 127-133.

## 1988

- Predy R, Malhotra SK, Das GD. Enhanced expression of a protein antigen (JI-31 Antigen, 30 Kilodaltons) by reactive astrocytes in lacerated spinal cord. *J Neurosci Res* 1988; 19: 397-404.

## 1989

- Das GD. Perspectives in anatomy and pathology of paraplegia in experimental animals. *Brain Res Bull* 1989; 22: 7-32.
- Das GD, Das KG, Brasko J, Reidl M, Rai P, Rajeswari V. Spinal traumas: Some postoperative complications in experimental animals. *Brain Res Bull* 1989; 22: 33-37.

## 1990

- Das GD. Neural transplantation: An historical perspective. *Neurosci Biobehav Rev* 1990; 14: 389-401.