

Biodata of Dr. V. P. Kamboj

INSA Honorary Scientist, Biotech Park, Lucknow
Former Director, Central Drug Research Institute, Lucknow
Former Chairman, Bharat Immunological & Biological Corp. Ltd, Bulandshahr
Former President, National Academy of Sciences, India
Hon. Professor, Panjab University, Chandigarh
Hon. Professor, Babasaheb Bhimrao Ambedkar University, Lucknow

- 1. Full Name** : **VED PRAKASH KAMBOJ**
- 2. Date of Birth** : 01.04.1937
- 3. Academic Qualifications** : M.Sc. (Hons), Ph.D., D.Sc.
- 4. (a) Employment with latest positions held** : All at CDRI, Lucknow since 1965
- Scientist 'F' from January, 1982-March 1990
 - Scientist 'G' from April 1990-October 1992
 - Acting Director November 1992
 - Director from December 1992 - March 1997
 - Emeritus Scientist April 1997 – March 2002
and
Chairman, BIBCOL, Bulandshahr 1998-2002

(b) Other Important Assignments:

- President, National Academy of Sciences, India, 2005-2006
- Chairman, DBT Task Force on Biotechnology Product & Process Development from 1997-2007
- Chairman, DBT Recombinant Genetic Manipulation Committee from 2006-2012
- Member, SAC-C, Govt. of India since 2005-2008

(c) Current Important Assignments

- Chairman, Biotech Consortium India Ltd., New Delhi since 1997-

- Chairman, Advisory com Monitoring Committee, Biotech Park, Lucknow since 2007-
- INSA Hon. Scientist, Biotech Park, Lucknow since 2007-
- Hon. Professor, Panjab University, Chandigarh since 2015-
- Hon. Professor, Babasaheb Bhimrao Ambedkar University, Lucknow since 2015-

5. Membership of Learned Bodies / Committees:

a) Committees

(i) National

1. Member Secretary, Research Advisory Council, CDRI, Lucknow, from 1975-77.
2. Member, Committee on Family Planning and Reproductive Biology to formulate the Science and Technology Plan of the State of Uttar Pradesh, from 1976-79.
3. Member, ICMR Task Force on Chemical Contraception, from 1980-81.
4. Member, ICMR Task Force on Post-coital Contraception, from 1980-84.
5. Member, ICMR Task Force on Antiimplantation, from 1984-87.
6. Member, ICMR Task Force on Plants for Fertility Regulation, from 1984-1987.
7. Member, ICMR Task Force on Steroid Biochemistry, from 1985-87.
8. Member, Working Group on Endocrinology, Sanjay Gandhi Post-Graduate Institute of Medical Sciences, Lucknow, from 1980-84.
9. Member, Advisory Board, Pt. Kamnath Homeopathic Research Unit, Motilal Nehru Homeopathic Hospital, Lucknow, from 1984-87.
10. Alternate Member, MOH & FW Standing Committee on Human Reproduction and Fertility Control, from 1985-91.
11. Member, DST-PAC on Biology of Reproduction from, 1986-87.
12. Member, ICMR Special Advisory Group on Contraception, from 1987-92.
13. Member, Research Area Panel in Reproductive Immunology, National Institute of Immunology, New Delhi, from 1988-91.

14. Member, Scientific Advisory Committee, Institute for Research in Reproduction, Bombay, from 1988-91.
15. Member, DST-PAC on Medical Biology, from 1988-91.
16. Member, Technical Advisory Committee, Central Council for Research in Unani Medicine, from 1988-90.
17. Secretary, Research Council, CDRI, Lucknow, from 1988-92.
18. Member, Scientific Advisory Board, ICMR, from 1989-91.
19. Member, Sectional Committee VII, Indian National Science Academy, from 1990-92.
20. Member, Biomedical Research Advisory Group, Family Planning Foundation, New Delhi, from 1991-93.
21. Member, MOH & FW Task Force for Introduction of New Contraceptive Devices/Techniques in the National Family Welfare programme, from 1991-98.
22. Member, DST-PAC on Immunology and Medical Biology, from 1991-94.
23. Member, National Committee for Research in Human Reproduction, (NCRHR), Ministry of Health & Family Welfare, Govt. of India, from 1992-98.
24. Member, NCRHR Sub-Committee to Identify Priority Areas for Research in Fertility Regulation, from 1992-98.
25. Member, NCRHR Sub-Committee to develop Guidelines for the Speedy Clearance of the Proposals for Clinical Trials/Approval of new Drugs in the field of Human Reproduction, from 1992-98.
26. Member, NCRHR Sub-Committee to Prepare Research Strategy for Promoting Research on Contraceptives under Indian Systems of Medicine, from 1992-98.
27. Member, Drugs Technical Advisory Board, Directorate General of Health Services, Govt. of India, New Delhi, from 1993-97.
28. Member, Governing Board, National Institute of Pharmaceutical Education and Research, Chandigarh, from 1993-97.
29. Member, Board of Directors, U.P. Drugs & Pharmaceuticals Ltd., Lucknow, from 1993-97.
30. Chairman, Ecomark Technical Sub-Committee, Central Pollution Control Board, from 1993-97.

31. Member, DBT Task Force on Immunological Approaches to Fertility Regulation, from 1993-97.
32. Member, Project Advisory Sub-Committee, National Project on Development of Potential Drugs from the Ocean, Department of Ocean Development, New Delhi, from 1993-2002.
33. Member, NRDC Prize Award and Financial Assistance Committee, New Delhi, from 1993-1997.
34. Member, DBT Task Force on Medical Biotechnology, from 1994-97.
35. Member, DBT Task Force on Reference Centres, from 1994-97.
36. Member, Medical Sciences Committee, CSIR, from 1994-1996.
37. Vice-President, Society of Biosciences, from 1994-97.
38. Member, Governing Board, Zaheer Science Foundation, New Delhi, from 1994-2001
39. Member, Research Board, Zaheer Science Foundation, New Delhi, from 1994-2001
40. Member, Research Council, ITRC, Lucknow, from 1995-1997.
41. Chairman, Expert Group on Technology Issues, Department of Chemicals and Petrochemicals, from 1995-97.
42. Vice-President, National Academy of Sciences, India, from 1995-96.
43. Member, DST-PAC in Health Sciences, from 1995-97.
44. Member, Planning Commission Working Group for the formulation of Ninth Five Year Plan (1997-2002) of the Department of Ocean Development, from 1995-96.
45. Member, DOD Expert Group on Marine Living Resources - Drugs and Chemicals, from 1995-96.
46. Member, PTC Advisory Committee, Lucknow, from 1995-1997.
47. Member, Internal Committee for Formulation of Good Laboratory Practice (GLP), CSIR, New Delhi, from 1995-1997.
48. Member, Planning Commission Working Group for the formulation of Ninth Five Year Plan (1997-2002) of the Council of Scientific & Industrial Research, New

Delhi, from 1995-96.

49. Member, Expert Committee of the DST Programme for Promoting R&D in Drugs and Pharmaceuticals Sector, from 1995-98.
50. Member, U.P. Pollution Control Board, Lucknow, from 1995-1998.
51. Member, Planning Commission Working Group for the formulation of Ninth Five Year Plan (1997-2002) of the Ministry of Environment & Forests, New Delhi, from 1995-96.
52. Member, Planning Commission Working Group for the formulation of Ninth Five Year Plan (1997-2002) of the Dept. of Chemicals & Petrochemicals, Ministry of Chemicals & Fertilizers, New Delhi, from 1995-96.
53. Member, Management Council, IMT, Chandigarh, from 1995-97.
54. Member, Working Group of Medical & Health, Council of Science & Technology, U.P., from 1995-97.
55. Chairman, Health Systems Research and Biomedical Research & Development of Ninth Five Year Plan (1997-2002), ICMR, New Delhi, from 1995-96.
56. Member, Research Council, IICB, Calcutta, from 1995-97.
57. Director, BIBCOL, Bulandshahar, from 1996-99.
58. General Secretary, The National Academy of Sciences, India, from 1997- 2000.
63. Director, Velvette (Int.) Pharma Ltd., Madras, from 1997- 1999.
59. Chairman, Biotechnology Consortium India Ltd., New Delhi, since 1997-
60. Member, Biotechnology Research and Promotion Committee, Dept. of Biotechnology, Govt. of India, from 1997- 2002
61. Chairman, DBT Task Force on Biotechnology Product & Process Development, from 1997- 2007
62. Member, Scientific Advisory Committee, Dept. of Biotechnology, Govt. of India, from 1997- 2005
63. Member, Scientific Advisory Committee (Overseas), Department of Biotechnology, Government of India, from 1997-2004.
64. Member, DBT Expert Committee for formulation of guidelines for generating pre-

clinical and clinical data for r-DNA based vaccines, diagnostics and other biologicals, 1997-98.

65. Member, DBT Apex Committee on Programme Support Activity, Indian Institute of Science, Bangalore, since 1997-2005
66. Member, DBT Task Force on Development of Vaccines for contraception - a multicentric study, from 1998-2003.
67. Chairman, DBT Review Committee for the Technology Perfection and Transfer of the agglutination based detection of HIV-1/2 antibodies in human blood, UDSC, New Delhi, from 1998-1999.
68. Member, Building & Finance Committee, National Centre for Cell Science, Pune, from 1998-2003.
69. Member, AIWA Awards Committee in Biotechnology, 1998 to 2003
70. Member, Governing Body, National Centre for Cell Science, Pune, from 1998-2003.
71. Member, Society, National Centre for Cell Science, Pune, from 1998-2003.
72. Member, ICMR Scientific Advisory Group on Toxicology and Pharmacology including Traditional Medicine, New Delhi, since 1998-
73. Member, Society, National Brain Research Centre, New Delhi, since 1999-2003
74. Member, Biosciences Award Committee, Department of Biotechnology, Govt. of India, from 2000-2004.
75. Member, Working Group for the formulation of the Tenth Five Year Plan (2002-2007) of Department of Biotechnology, 2001
76. Member, Expert Committee for selecting awardees for Biotech Products & Process Development and Commercialization awards, Department of Biotechnology, Govt. of India, from 2001- 2005
77. Member, Scientific Advisory Group, National Institute for Research in Reproductive Health, Mumbai, from 2003-2006
78. Co-Chairman, Advisory Committee, Biotech Park, Lucknow, from 2003-2007
79. Member, Governing Body, Biotech Park, Lucknow, since 2003-
80. Member, Research Council, National Botanical Research Institute, Lucknow

since 2004-2007

81. General Secretary, The National Academy of Sciences, India, 2004.
82. Special Invitee, Scientific Advisory Committee, National Centre for Cell Science, Pune, from 2005-2008
83. Co-Chairman, DBT Task Force on Nutraceuticals, from 2005-2008
84. Member, Advisory Committee on Himachal State Biotech Park, from 2005-2007
85. President, The National Academy of Sciences, India, from 2005-2006
86. Chairman, Advisory & Monitoring Committee, Biotech Park, Lucknow since-2007-
87. Member, Council, Indian National Science Academy, 2007, 2008-2010
88. Co-Chairman, Toxicity Advisory Group, ICMR, since 2007-
89. Co-Chairman, ICMR Clinical Pharmacology Group, since 2010-
90. Member, Monitoring Committee, Nurturing a new Pan-CSIR drug pipe line high Intensity preclinical studies on lead candidates (CSIR-DPL), IIIM, Jammu since 2013
91. Member, Expert Committee to Formulate Policy and Guidelines for Approval of New Drugs, Clinical trials and Banning of Drugs in India, 2013
92. Member, Biotechnology Vision Group of the State of Uttar Pradesh, 2013
93. Member, DBT Monitoring & Mentoring Group to establish Rural Biotechnology Centres and Rural Entrepreneur Development Centres since-2014
94. Chancellor's nominee to Panjab University, Chandigarh since 2008-
95. Chainman, DBT Social Sciences Award for Society Committee since 2015-

ii) International

1. Member, Steering Committee of the WHO Task Force on Vaginal & Cervical Devices for Fertility Regulation, from 1977-79.
2. Member, Indo-US Subcommission Group in Contraception, from 1990-92.
3. Member, WHO-TDR Programme Steering Committee on I-CHEM, from 1994-1997.

4. Member, WHO-TDR Programme Steering Committee on Institution Strengthening, from 1994-1995.
5. Member, Apex Committee and Joint Working Group (Indian side) of the Indo-US Vaccine Action Programme, from 1997- 2002.
6. Co-Chairman, Joint Working Group (Indian side) of the Indo-US Programme on Contraceptive and Reproductive Health Research, from 1998-2002.
7. Member, Sub-working Group on Biotechnology under the Indo-Russian Working Group on Science & Technology, from 1998-2002.
8. Member, Indo-Swiss Committee on Biotechnology to formulate new ISCB, from 1998-2003.

(b) Editorial Board

1. Member, Indian J. Exp. Biol. from 1986-90
2. Member, Journal of Research in Ayurveda & Siddha, 1992-97
3. Member, Bulletin of Medico-Ethno Botanical Research, 1992-97
4. Member, Indian Drugs, 1993-2000
5. Member, Indian J. Med. Res., 1993-2001
6. Member, National Academy Sciences Letters, 1994-2004
7. Member, Med. & Aromat. Plants Abstr., 1994-2007
8. Member, JMAPS, 1995-2007

(c) Societies/Academies

1. Life Member, Endocrine Society of India.
2. Life Member, Indian Pharmacological Society.
3. Life Member, Panjab University Zoological Society.
4. Life Member, Panjab University Alumni Association.
5. Life Member, U.P. Association for the Advancement of Science.
6. Life Member, Indian Society for the Study of Reproduction & Fertility
7. Life Member, Society of Biosciences.
8. Member, Society for the Study of Reproduction, U.S.A.

(d) Honours & Awards

1. Member, New York Academy of Sciences, U.S.A.
2. Fellow, The National Academy of Sciences, India.
3. Fellow, Indian National Science Academy.

4. Honorary Fellow, Biotechnology Research Society of India
5. Honorary Fellow, BIOVED Research Society.
6. Vasvik Research Award for Biological Sciences & Technology, 1989.
7. Ranbaxy Research Award in Applied Medical Sciences, 1992.
8. Bharat Jyoti Award in Science, 1993.
9. Dr. Engineer Memorial Oration Award, KGMC, Lucknow 1994.
10. K.N. Bahl Memorial Gold Medal of Society of Biosciences, 1995.
11. Gujarat- Bhargava Memorial Oration, KGMC, 1995
12. Ved Prakash Seth Foundation Award for Contributions to Health Care, 1996.
13. Shri Om Prakash Bhasin Award in Health & Medical Sciences, 1996.
14. Dr. B.N. Ghosh Lecture Oration Award of Indian Pharmacology Society, 1996.
15. FICCI Award for Life Sciences including Agriculture, 1997.
16. First recipient of Vigyan Gaurav Samman Award of the Govt. of Uttar Pradesh for Outstanding Achievements in Science & Technology, 2000
17. Prof. Vishwa Nath Award Lecture, Panjab University, Chandigarh, 2011
18. Dr. Vishwa Nath Memorial Lecture, ANDROCON, 2011
19. Vigyan Rattan award, Panjab University, 2011
20. Vigyan Vibhushan award, First Uttar Pradesh Science Congress, 2013
21. Panjab University Pharmaceutical Sciences Oration award, 2013
22. Award for outstanding contributions to Science & Technology, 101st Indian Science Congress, Jammu, 2013
23. Life-time achievement award by the Indian Society for the Study of Reproduction & Fertility, 2013
24. Vigyan Ratna Award by BBAU, Lucknow, 2016

6. Publications

- (a) Rresearch papers and review articles: Published over 250 research papers and review articles in national and international journals
- (b) Patents: Co-inventor of 42 patents.

7. Experience in R&D and General Management

1. Management of a National Institute and Public Sector Company
2. Planning, Programming and monitoring of R&D activities
3. Budget planning vis-a-vis R&D activities
4. Business development vis-a-vis product marketing
5. Interaction with the Ministry of Health & Family Welfare, Ministry of Chemicals and Fertilizers, DST, DBT, ICMR, Drugs Controller and Pharmaceutical Industry.
6. Interaction with WHO, other international agencies and Pharmaceutical industries in the area of new drug/drug technology/vaccine/diagnostic development.
7. Successfully converting a loss making Public Sector Company (BIBCOL- OPV Production) into a profit making unit in 3 years by strategic planning and optimizing vaccine production

8. Research and Development Experience

Over 40 years R&D experience in new drug development (synthetic or plant based, marine fauna & flora)/ vaccine/immunodiagnostic development with specialization on research and development in Fertility Control, Reproductive Biology and Endocrinology. And of 3 years in managing a public sector polio vaccine production company. Have guided 18 students for Ph.D. and 30 for M.D./M.S. degrees and is an examiner for Ph.D. degree of various universities.

Main R&D contributions:

Participated in the development of:

1. Centchroman as a contraceptive: A new nonsteroidal weekly oral contraceptive - Marketed as 'Saheli' & 'Centron'.
2. Centchroman for control of dysfunctional uterine bleeding – Marketed as 'Sevista'
3. Centchroman for breast cancer: Found to be useful for the management of advanced Breast cancer multicentric trial
4. Isaptent I & II: An aid for medical termination of pregnancy and for gynaecological situations needing cervical dilatation - Marketed as DILEX-C.
5. Consap Cream: A non-pH dependent natural product based spermicidal cream - Licensed to HLL for marketing.
6. Brahmi extract: An herbal drug for memory - Marketed as Memory Plus.

Involved in clinical trials of New Drugs:

- (a) Arteether & Compound 80/53 - New antimalarials
- (b) Compound 82/437 - A macrofilaricide
- (c) Compound 81/470 - A broad spectrum anthelmintic

9. Outputs as Director CDRI

I. Products released for marketing by the former Hon'ble Prime Minister Shri P.V. Narasimha Rao ji on 28th February, 1996

a) Drugs

1. Chandonium iodide, a neuromuscular blocking agent
2. Brahmi extract, an herbal drug for memory improvement

b) Diagnostic kit

1. A simple test for early diagnosis of kala-azar

c) Drugs technology

1. Acyclovir
2. Leuprolide

II. Products licensed to industry for joint development

International

1. Centchroman for osteoporosis, restenosis and other disorders.
2. Compound 80/574 for lipid lowering (hypolipidemic) and diabetes.

National

1. Artether, an antimalarial.
2. Compound 80/53, an antirelapse antimalarial.
3. Compound 80/470, a broad spectrum anthelmintic.
4. Compound 82/437, a macrofilaricide (antifilarial).

III. Joint projects with industry for lead generation/optimization/development

International

1. Antiestrogens/nonsteroidal compounds against osteoporosis, restenosis and psoriasis.

National

1. Hepatoprotectives
2. Antimycobacterials and antifungals

IV. Drugs technology developed and licensed

1. Acyclovir
2. Leuprolide
3. Primaquin
4. Sumatriptan
5. l-lysine
6. Artemether
7. Ovaprim
8. Mefloquin

V. Drugs technology licensed (earlier developed)

1. 1-Ephedrine
2. Palatable herbal laxative

VI. Centchroman, a weekly nonsteroidal oral contraceptive enters National Family Welfare Programme.

VII. Technology sourcing, development & licensing

Closely involved with DBT in promoting excellence in biotechnology research, identification and development of prospective leads as products; regulation of recombinant products; and facilitating product licensing through BCIL to industry for production and marketing. 12 diagnostics including those for HIV-I&II, Hepatitis-C, JEV etc. and Biofertiliser sourced from academia have been packed and licensed to industry for marketing.

VIII. Vaccine Production

Strategic planning and management of oral polio vaccine production facility, BIBCOL, a public sector unit of Govt. of India at Bulandshahr led to its turn around from loss making to a profit making unit. In 3 years, BIBCOL produced nearly 650 million doses, paid back loans, came out of BIFR and was under net profit.

.10. Application oriented Basic studies

The main scientific interest has been in application oriented basic studies on reproductive biology particularly in elucidating the mode of action and long-term effects of contraceptives and in the development of new and novel family planning methods including herbals. The salient contributions of his group are given below:

Extensive studies on hormonal profile of **nonsteroidal postcoital antifertility agents** and detailed studies on three compounds of different structural types in different species of animals including monkeys have revealed that weak estrogenic activity along with potent antiestrogenic and/or antiprogestational properties is a prerequisite for a molecule to have postcoital contraceptive efficacy. This has been confirmed in human as well. In depth studies on their mechanism of contraceptive action have shown that such compounds, despite the presence of developing embryo suppress decidualization as well as the associated biochemical events in the uterus. However, they do not have a direct cytotoxic effect on embryos since they implant normally after substitution therapy with estrogen plus progesterone or when transferred to suitable recipients or foster mothers. Detailed studies on ovum development with a new contraceptive, **Centchroman**, have clearly demonstrated that it alters egg transport, development and zona shedding and thereby produces asynchrony between ovum and endometrium development; however, the preimplantation embryos are normal. Studies on the role of pre-implantation embryos

in implantation and maternal recognition of pregnancy have revealed increased activity of carbohydrate metabolizing enzymes and accumulation of energy substrates in the uterus in presence of embryos. The period of high endometrial sensitivity to decidual stimulus of blastocyst lasting for about 12 hours is induced by nidatory estrogen secreted on day 4 postcoitum. Studies on cytological and biochemical mechanisms of implantation showed that the period of maximal endometrial sensitivity in rat is associated with high uterine nuclear and cytosolic estrogen and progesterone receptor concentration and peroxidase activity, low columnar epithelium with undulating surface and intracellular membranes containing electron transparent apical vesicles and loose edematous antimesometrial stroma. The inhibition of implantation by antiestrogen appears to be mediated via inhibition of pinocytosis/ endocytosis, uterine luminal closure and apposition of blastocyst trophoblast within the uterine luminal epithelium. Further increase in plasma levels of both estradiol and progesterone on days 8, 10 and 12 post-uterine traumatization in guinea pigs together with the increased cytosolic and nuclear ER and PR concentration, particularly in the antimesometrial segment of the uterus, suggest requirement of both the hormones for decidualization in this species. Further Centchroman produces no effect on time or extent of secretion of nidatory estrogen or progesterone or uterine nuclear and cytosolic progesterone receptor kinetics during the pre-implantation period at the contraceptive dose. Mild stimulation in tubal transport and cleavage rate of pre-implantation embryos, blastocyst formation and retardation in zona shedding have been suggested to be significant in relation to its anti-implantation action. It inhibits uterine decidualization, alters implantation associated biochemical markers such as RNA, protein, alkaline phosphatase, phospholipid synthesis and causes glycogen depletion. Additionally, it inhibits steroid metabolism in preimplantation rabbit blastocysts *in vitro* and thus exposes them to toxic effects of steroids.

Studies on the cyclic administration of **Enovid**, immediately after the clinical introduction of this first oral contraceptive, to monkeys virtually throughout their prepubertal period, 3 years, have shown that this contraceptive does not cause any adverse changes in the genital organs nor interfered with their normal sexual development. However, prolonged administration of estrogen, an important component of contraceptive pills, to adult male rhesus monkeys causes reversible suppression of oxygen consumption rate and gonadotrophin activity of the pituitary, indicating that the effects on pituitary are not of a permanent nature.

Extensive studies on the contraceptive efficacy, mode of action and safety of **intrauterine contraceptive device IUD** in rodents, monkeys and women have demonstrated that the device invokes infiltration of leucocytes and causes marked increase in nitrogen levels of the uterine fluid. Thus, IUD exerts contraceptive action primarily by rendering the uterine fluid milieu metabolically inert for the growth and survival of preimplantation embryos. The device does not interfere with post partum involution of uterus. Further the long term residence of IUD does not affect the physiology, biochemistry and metabolism of the uterus. It also does not evoke any noteworthy histological and histochemical or biochemical changes in the uterus and fallopian tube in rodents and monkey. Calcium and iron have been found to be deposited after prolonged intrauterine IUD residence in rat and women. These studies clearly reveal that IUD can be safely used by women for long periods.

Family Planning agents/devices

Centchroman

Studies on this novel nonsteroidal postcoital and weekly-cum-biweekly contraceptive have revealed that it exerts its contraceptive action peripherally by suppressing decidualization and additionally by causing asynchrony between ovum and endometrium development without interfering with hypothalamus pituitary ovarian axis in monkeys and women, a distinct advantage over steroidal oral pills. It does not disturb pituitary, adrenal and thyroid functions. It is currently marketed as **Saheli** for contraception and **Sevista and Novex DS** for dysfunctional uterine bleeding as also for **mastalgia** and **fibroadenoma**. It may serve as a **prophylactic for breast cancer** as it has been shown to be protective in cases of advanced cancer of breast in a multicentric phase II clinical trial. It has also been found to be **curative against osteoporosis** in postmenopausal women in a multicountry clinical trial but was accompanied by increase of 1 to 2% in frequency of micturition and uterine prolapse in some cases which has not been observed in contraceptive users of reproductive age.

Isaptent

In an effort to provide a cheap, gradually swelling and self-lubricating cervical dilator for use in medical termination of pregnancy, Isaptent, utilizing water absorbing property of Isapgol, *Plantago ovata*, seed husk has been developed and marketed as **DILEX C**. It is also useful in women needing cervical dilation for gynaecological disorders.

Consap

The work on the development of spermicides as local contraceptives has resulted in the development of a spermicidal cream, Consap, incorporating saponin rich fraction of Soapnut, *Sapindus mukorossi*. This herbal spermicide, unlike Nonyl is not pH dependent, and functions by disrupting sperm membrane. This has been recently licensed to HLL Life care Ltd for marketing as an intra vaginal herbal local contraceptive cream.

Intra-fallopian tube and Intra vas device

Introduced the concept of a simple and reversible IFTD and IVD for female and male contraception and demonstrated their contraceptive effect in animals but were not protective for prolonged periods even in animals.

Herbal contraceptives from Plants

Evaluated a large number of medicinal plants and marine flora or fauna for postcoital contraceptive and/or abortifacient activity in rats and spermicidal and semen coagulating properties on human semen but none except soapnut saponins were worthy of development. All the plants showing postcoital contraceptive activity in rodents possessed estrogenic activity and were, therefore, not considered suitable for development as a contraceptive.

Metals for contraception

The administration of cadmium chloride by subcutaneous, intratesticular, topical or scrotal inunction causes irreversible destruction of spermatogenesis in rats and monkeys associated with progressive severe calcification of seminiferous tubules between 7 and 90 days post-treatment. Concurrent administration of zinc acetate, selenium dioxide or vitamin E prevents spermatogenic damage and calcium deposition. Strontium and cobalt salts also provide some protection from noxious effects of cadmium on testis.

In an effort to develop a safe metal for contraception, more than 32 water soluble salts of metals and rare earths covering almost all the groups of the periodical table have been evaluated for their effect on spermatogenesis after a single administration in rats and mice; of which 32 exerted some degree of antitesticular effect and nine caused selective spermatogenic arrest by continuous subcutaneous administration.

Impact of the Work done

Application oriented basic studies on reproductive biology and endocrinology have led to the development of World's first and the only one so far nonsteroidal oral contraceptive, Centchroman, which is meeting the demands of family planning since 1991 and is currently under the National Family Welfare Programme. He has not only elucidated in detail the mode of action and safety of Centchroman but also elucidated but also studied the mode of action and long term effect of contraceptives namely steroidal oral contraceptives and intrauterine contraceptive thereby laid to rest doubts about their long term safety. Also attempted new and novel approaches for contraception namely intra fallopian device and intra vas device. These studies have resulted in more than 250 research papers in national and international peer reviewed journals, 42 national and international patents, 20 students have been awarded Ph.D. and 30 MD/MS degrees. The studies have got him national and international recognition in the form of awards, member/chairman of State, National and International Committees of World Health Organization, Indo-US Sub-Commissions, Indo-Russian Working Group and Indo-Swiss Committee in Biotechnology. Has contributed to different committees of CSIR, DST, DBT, ICMR, MOH and FW, Ministry of Chemicals and Fertilizers, Drugs Controller General of India and Industry. Has been elected as Fellow of INSA and NASI and Honorary Fellow, Biotechnology Research Society of India. Elected President, National Academy of Sciences, India for the years 1995 and 1996.

Contribution to the field

These studies have enriched basic and applied knowledge in reproductive biology and family planning. As Chairman of the DBT Review Committee on Genetic Manipulation steered the development of Guidelines for the development of Similar Biologics or Biosimilars and safety guidelines for Transgenic Crops. As member of the CDSCO committee developed guidelines for the clinical trial of drugs in about six months; these trials were virtually stopped by the Supreme Court on the basis of Parliamentary Committee report. As a Member of the Working Group for the formulation of Science and Technology of the IX Plan of various science and technology departments played a

key role in timely development of the programmes of different departments for the five year plan period.

Contribution to Society

The **nonsteroidal oral contraceptive, Centchroman**, developed under his active participation is **meeting the demands of family planning since 1991, under Social Marketing Programme of the MOH and FW from 1995 and now from April 2016 under National Family Welfare Programme**. The **new antimalarial, alpha beta artether steered by him at CDRI and licensed to Indian industry is available in over 40 countries for the control of malignant malaria** and the **artemether, another antimalarial marketed by CDRI technology licensed by him is also used by the population of nearly 40 countries for the control of malignant malaria**. As **Chairman of BIBCOL, oral polio vaccine production unit in public sector, revived this unit, escalated production from 20 million doses to 300 million doses in three years to meet the demands of national polio control programme and converted this loss making unit into a profit making one.**

11. List of Publications of Dr. V.P. Kamboj

001 Gupta B L & **Kamboj V P**

Succinic dehydrogenase in the silk glands of Bombyx mori.
Res. Bull. Panjab Univ. 1961, 12: 165-168.

002 Gupta B L & **Kamboj V P**

Histochemical localization of succinic dehydrogenase activity in the mitochondria of some invertebrate spermatozoa.
Nature 1962, 193: 788-789.

003 Gupta B L & **Kamboj V P**

Lipids in the silk glands of Bombyx mori and their probable secretory metabolism.
Experientia 1962, 18: 24-26.

004 Kar A B, Das R P & **Kamboj V P**

Thyroid status and formation of experimental hydro-uteri in rats.
J. Sci. Industr. Res. 1962, 21C: 165-166.

005 Kar A B, **Kamboj V P** & Das R P

Incipient follicular atresia and acid phosphatase activity in ovary and serum of rats.
J. Sci. Industr. Res. 1962, 21C: 231-237.

006 Kar A B & **Kamboj V P**

Sterilization of males by scrotal inunction of cadmium chloride.
J. Reprod. Fertil. 1963, 5, 461.

- 007 Kar A B & **Kamboj V P**
Proceedings of the Biology
1963.
- 008 Kar A B & **Kamboj V P**
Sterilization of rats and rhesus monkeys by scrotal inunction of cadmium chloride.
Proc. 7th IPPF Conf. 1963, 465-477.
- 009 **Kamboj V P** & Kar A B
Antitesticular effect of metallic and rare earth salts.
J. Reprod. Fertil. 1964, 7: 21-28.
- 010 **Kamboj V P** & Kar A B
Effect of iron salts on the genital organs and fertility of male rats.
Acta Biol. Med. Germ. 1964, 13: 928-945.
- 011 Kar A B, Goswami A, **Kamboj V P** & Chowdhury S R Studies on
methylcholanthrene induced fibrosarcoma of rat testis and its response to cadmium.
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12. Patents filed by Dr. V.P. Kamboj

a) National

- 101713 1. 'Synthesis of substituted 2,3-diphenylbenzofurans as antifertility agents'. P.K. Gorver, H.P.S. Chawla, Nitya Anand, **V.P. Kamboj** and A.B. Kar.
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