

ANNUAL REPORT
OF
THE HAFFKINE INSTITUTE

For the Years 1996-2001



HAFFKINE INSTITUTE
PAREL, MUMBAI 400012
INDIA

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Haffkine Institute for Training, Research & Testing
Governing Council
 (1996 - 1997)

President

Dr. Daulatrao Aher.
 Honorable Minister
 Public Health, Medical Education & Drugs
 Govt. of Maharashtra, Mumbai.

Vice President

Honorable Minister of State
 Public Health, Medical Educations & Drugs.
 Govt. of Maharashtra, Mumbai.

Member Secretary

Director
 Haffkine Institute for Training, Research & Testing
 Parel, Mumbai.

Members :

- | | |
|--|--|
| <ul style="list-style-type: none"> • Secretary.
Dept. of Medical Education & Drugs.
Mantralaya. • Commissioner.
Food & Drugs Administration.
Govt. of Maharashtra, Mumbai. • Director General.
Indian Council of Medical Research.
New Delhi. • Director General of Health Services.
Govt. of Maharashtra, Mumbai. | <ul style="list-style-type: none"> • Vice Chancellor,
University of Mumbai.
Mumbai. • Jt. Secretary / Deputy Secretary
Finance Department,
Govt. of Maharashtra, Mumbai. • Director of Medical Edu. & Research
Govt. of Maharashtra.
Mumbai. • Deputy Director of Health Services
Govt. of India, New Delhi. |
|--|--|
- Dr. V. H. Salaskar
 Scientist Emeritus,
 Mumbai.
-

Haffkine Institute for Training, Research & Testing
Governing Council
 (1997 - 1998)

President

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 Public Health, Medical Education & Drugs
 Govt. of Maharashtra, Mumbai.

Vice President

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 Public Health, Medical Educations & Drugs.
 Govt. of Maharashtra, Mumbai.

Member Secretary

Director
 Haffkine Institute for Training, Research & Testing
 Parel, Mumbai.

Members :

- Secretary,
Dept. of Medical Education & Drugs.
Mantralaya.
- Commissioner,
Food & Drugs Administration.
Govt. of Maharashtra, Mumbai.
- Director General,
Indian Council of Medical Research.
New Delhi.
- Director General of Health Services.
Govt. of Maharashtra, Mumbai.
- Vice Chancellor,
University of Mumbai.
Mumbai.
- Jt. Secretary / Deputy Secretary
Finance Department,
Govt. of Maharashtra, Mumbai.
- Director of Medical Edu. & Research
Govt. of Maharashtra.
Mumbai.
- Deputy Director of Health Services
Govt. of India, New Delhi.
- Dr. V. H. Salaskar
Scientist Emeritus,
Mumbai.

Haffkine Institute for Training, Research & Testing
Governing Council
(1999 - 2000)

President

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Honorable Minister
Public Health, Medical Education & Drugs
Govt. of Maharashtra, Mumbai.

Vice President

Honorable Minister of State
Public Health, Medical Educations & Drugs.
Govt. of Maharashtra, Mumbai.

Member Secretary

Director
Haffkine Institute for Training, Research & Testing
Parél, Mumbai.

Members :

- Secretary,
Dept. of Medical Education & Drugs.
Mantralaya.
- Commissioner,
Food & Drugs Administration.
Govt. of Maharashtra, Mumbai.
- Director General,
Indian Council of Medical Research.
New Delhi.
- Director General of Health Services.
Govt. of Maharashtra, Mumbai.
- Vice Chancellor,
University of Mumbai.
Mumbai.
- Jt. Secretary / Deputy Secretary,
Finance Department,
Govt. of Maharashtra, Mumbai.
- Director of Medical Edu. & Research
Govt. of Maharashtra.
Mumbai.
- Deputy Director of Health Services
Govt. of India, New Delhi.
- Dr. R. V. Karanjkar
Medical Director,
Leelavati Hospital, Mumbai.

Haffkine Institute for Training, Research & Testing
Governing Council
 (2000 - 2001)

President

Shri. Digvijay Khanvilkar.
 Honorable Minister
 Public Health, Medical Education & Drugs
 Govt. of Maharashtra, Mumbai.

Vice President

Honorable Minister of State
 Public Health, Medical Educations & Drugs.
 Govt. of Maharashtra, Mumbai.

Member Secretary

Director
 Haffkine Institute for Training, Research & Testing
 Parel, Mumbai.

Members :

- | | |
|---|--|
| <ul style="list-style-type: none"> • Secretary,
Dept. of Medical Education & Drugs.
Mantralaya. • Commissioner,
Food & Drugs Administration.
Govt. of Maharashtra, Mumbai. • Director General,
Indian Council of Medical Research.
New Delhi. • Director General of Health Services
Govt. of Maharashtra, Mumbai. | <ul style="list-style-type: none"> • Vice Chancellor,
University of Mumbai.
Mumbai. • Jt. Secretary / Deputy Secretary
Finance Department,
Govt. of Maharashtra, Mumbai. • Director of Medical Edu. & Research
Govt. of Maharashtra.
Mumbai. • Deputy Director of Health Services
Govt. of India, New Delhi. |
| <ul style="list-style-type: none"> • Dr. R. V. Karanjkar
Medical Director,
Leelavati Hospital, Mumbai. | |



Haffkine Institute for Training, Research & Testing
Research Advisory Council
(1997 - 1998)

Chairman

Dr. V.L. Yemul.
Director, H.I.T.R.T, Mumbai.

Members :

- | | |
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| • Dr. N.K. Ganguly.
Prof. & Head, Dept. of Exp. Medicine,
P.G. Inst. of Med. Edu. & Research,
Chandigarh. | • Dr. R.C. Mahajan.
Prof. & Head, Dept. of Parasitology,
P.G. Inst. of Med. Edu. & Research
Chandigarh. |
| • Dr. (Mrs) Sudha Gangal.
Head, Dept. of Immunology.
C.R.I., Mumbai. | • Dr. B.P. Gothaskar.
Head, Dept. of Biological Chemistry.
C.R.I., Mumbai. |
| • Dr. S.K. Mahajan.
Head, Div. of Biology & Agriculture.
B.A.R.C., Mumbai. | • Dr. M.J. Mulky.
Head, Product & Environmental Safety.
Hindustan Lever Ltd., Mumbai. |
| • Director of Med. Edu. & Research.
(D.M.E.R.), Mumbai. | • Dr. Subhash Salunke.
Director of Health Services.
Mumbai. |
| • Dr. B.N. Dhawan.
Director, C.D.R.I.,
Lucknow. | • Dr. Kalyan Bangerjee.
Director, National Inst. of Virology,
Pune. |

Convener
Assistant Director,
H.I.T.R.T., Mumbai.

Haffkine Institute for Training, Research & Testing
Research Advisory Council
 (1998 - 1999)

Chairman

Dr. B.G. Khadse.
 Director, H.I.T.R.T, Mumbai.

Members :

- | | |
|--|---|
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Prof. & Head, Dept. of Exp.tal Medicine,
P.G. Inst. of Med. Edu. & Research.
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Prof. & Head, Dept. of Parasitology,
P.G. Inst. of Med. Edu. & Research
Chandigarh. |
| <ul style="list-style-type: none"> • Dr. (Mrs) Sudha Gangal.
Head, Dept. of Immunology.
C.R.I., Mumbai. | <ul style="list-style-type: none"> • Dr. B.P. Gothaskar.
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C.R.I., Mumbai. |
| <ul style="list-style-type: none"> • Dr. S.K. Mahajan.
Head, Div. of Biology & Agriculture.
B.A.R.C., Mumbai. | <ul style="list-style-type: none"> • Dr. M.J. Mulky.
Head, Product & Environ.tal Safety.
Hindustan Lever Ltd., Mumbai. |
| <ul style="list-style-type: none"> • Director of Med. Edu. & Research.
(D.M.E.R.), Mumbai. | <ul style="list-style-type: none"> • Dr. Subhash Salunke.
Director of Health Services.
Mumbai. |
| <ul style="list-style-type: none"> • Dr. B.N. Dhawan.
Director, C.D.R.I.,
Lucknow. | <ul style="list-style-type: none"> • Dr. Kalyan Bangerjee.
Director, National Inst. of Virology,
Pune. |

Convener
 Assistant Director,
 H.I.T.R.T., Mumbai.

Haffkine Institute for Training, Research & Testing
Research Advisory Council
(1999 - 2000)

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Dr. B.G. Khadse.
Director, H.I.T.R.T, Mumbai.

Members :

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| • Dr. V. L. Deshpande.
Director of Medical Edu. & Research,
Govt. of Maharashtra, Mumbai. | • Dr. Subhash Salunke.
Director General of Health Services.
Govt. of Maharashtra, Mumbai. |
| • Dr. B. A. Gadkari.
Director, National Inst. of Virology,
Pune. | • Dr. H.S. Palep.
Hon. Prof. of Obstrat. & Gynecology,
Grant Medical College, Mumbai. |
| • Dr. K. V. Sainis.
Head, Immunology Section.
B.A.R.C., Mumbai. | • Dr. (Mrs) Pratibha Worlikar.
Prof. of Pharmacology,
Grant Medical College, Mumbai. |

Convener
Assistant Director,
H.I.T.R.T., Mumbai.

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(2000 - 2001)

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Director General of Health Services.
Govt. of Maharashtra, Mumbai. |
| • Dr. B. A. Gadkari.
Director, National Inst. of Virology,
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Hon. Prof. of Obstrat. & Gynecology,
Grant Medical College, Mumbai. |
| • Dr. K. V. Sainis.
Head, Immunology Section.
B.A.R.C., Mumbai. | • Dr. (Mrs) Pratibha Worlikar.
Prof. of Pharmacology,
Grant Medical College, Mumbai. |

Convener

Assistant Director,
H.I.T.R.T., Mumbai.

Haffkine Institute for Training, Research & Testing, Mumbai.
Executive Committee

1996 - 1997	1997 - 1998
Chairman	Chairman
Dr. V. L. Yemul Director	Dr. V. L. Yemul Director
Members	Members
• Dr. B.G. Khadse, Assistant Director.	• Dr. B.G. Khadse, Assistant Director.
• Dr. S.V. Gadre, Assistant Director.	• Dr. S.V. Gadre, Assistant Director.
• Dr. N.G. Chanderkar, Assistant Director.	• Dr. N.G. Chanderkar, Assistant Director.
Convener	Convener
Shri. M.G. Mehendale, CAO(Addl.Charge)	Dr. B.G. Khadse, CAO(Addl.Charge).
1998 - 1999	1999 - 2000
Chairman	Chairman
Dr. B.G. Khadse Director	Dr. B.G. Khadse Director
Members	Members
• Dr. S.V. Gadre, Assistant Director.	• Dr. S.V. Gadre, Assistant Director.
• Dr. N.G. Chanderkar, Assistant Director.	• Dr. N.G. Chanderkar, Assistant Director.
• Dr. M.G. Phatak, Assistant Director.	• Dr. M.G. Phatak, Assistant Director.
Convener	Convener
Dr. S.V. Gadre, CAO(Addl.Charge)	Dr. S.V. Gadre, CAO(Addl.Charge)
2000 - 20001	
Chairman	
Dr. (Mrs) M.A. Phadke Director	
Members	
• Dr. M.G. Phatak, Assistant Director.	
• Dr. (Mrs) C.H. Pandit, Sr. Sci. Officer (CI-I)	
Convener	
Shri.C.S. Chavan, CAO.	

Staff of the Haffkine Institute For Training, Research & Testing
1996 - 1997

Administration**Director :**

Dr. Y.L. Yemul.

Chief Administrative Officer :

Shri. M.G. Mehendale

Accounts Officer :

Shri. D.S. Desai.

Bacteriology :

Assistant Director :

Dr. S.V. Gadre.

Senior Scientific Officer (CI - II) :

Shri. S.P. Gajbhiye.

Biochemistry :

Junior Scientific Officer :

Shri. H.V. Phadnis.

Chemotherapy :

Assistant Director :

Dr. B.G. Khadse.

Junior Scientific Officer :

Shri. K.R. Pawar

Clinical Pathology :

Senior Scientific Officer (CI - I) :

Dr.(Mrs) Y. Fernandis.

Dr.(Mrs) C.H. Pandit.

Human Pharmacology & Bioavailability:**Radiation Biology & Epidemiology**

Assistant Director :

Dr. N.G. Chanderkar.

Junior Scientific Officer :

Shri. P.R. Sangole.(till 30-4-96)

Immunology :

Senior Scientific Officer :

Vacant

Instrumentation Cell :

Junior Scientific Officer :

Shri. J.V. Savant.

Library

Librarian :

Mrs. M.V. Joshi.

Pharmacology :

Senior Scientific Officer (CI - I) :

Dr. A.D. Nadkarni.

Junior Scientific Officer :

Shri. L.S. Patil.

Statistics :

Statistician : Shri. A.S. Arekar.

Testing Unit :

Senior Scientific Officer (CI - I) :

Vacant

Senior Scientific Officer (CI - II) :

Shri. S.S. Jain.

Junior Scientific Officer :

Dr. S.B. Dholam.

Shri. A.D. Kahar.(from: 7-10-96)

Toxicology :

Assistant Director :

Dr. M.G. Phatak.

Virology :

Senior Scientific Officer (CI -

Dr. (Mrs) R.A. Deshmukh.

Zoonosis :

Senior Scientific Officer (CI - I) :

Dr. B.D. Sathe.

Dr. N.K. Sutar.

Junior Scientific Officer :

Dr. (Mrs) V.R. Kamath.

Shri. A.P. Kahar.(till 6-10-96)

Staff of the Haffkine Institute For Training, Research & Testing 1997 - 1998

Administration**Director :**

Dr. Y.L. Yemul.

Chief Administrative Officer :

Shri. M.G. Mehendale (up to 30-6-97)

Dr. B.G. Khadse (1-7-97 to 31-3-98)

Accounts Officer :

Shri. D.S. Desai. (till 20-10-97)

Shri. A.G. More (From 21-10-97)

Bacteriology :

Assistant Director :

Dr. S.V. Gadre.

Senior Scientific Officer (CI - II) :

Shri. S.P. Gajbhiye.

Biochemistry :

Junior Scientific Officer :

Shri. H.V. Phadnis. (up to 28-2-1998)

Chemotherapy :

Assistant Director :

Dr. B.G. Khadse.

Junior Scientific Officer :

Shri. K.R. Pawar

Clinical Pathology :

Senior Scientific Officer (CI - I) :

Dr. (Mrs) Y. Fernandis.

Dr. (Mrs) C.H. Pandit.

Human Pharmacology & Bioavailability:**Radiation Biology & Epidemiology**

Assistant Director :

Dr. N.G. Chandekar.

Junior Scientific Officer :

Shri. P.R. Sangole. (till 30-4-96)

Immunology :

Senior Scientific Officer :

Vacant

Instrumentation Cell :

Junior Scientific Officer :

Shri. J.V. Savant.

Library

Librarian :

Mrs. M.V. Joshi.

Pharmacology :

Senior Scientific Officer (CI - I) :

Dr. A.D. Nadkarni.

Junior Scientific Officer :

Shri. L.S. Patil.

Statistics :

Statistician : Shri. A.S. Arekar.

Testing Unit :

Senior Scientific Officer (CI - I) :

Vacant

Senior Scientific Officer (CI - II) :

Shri. S.S. Jain.

Junior Scientific Officer :

Dr. S.B. Dholam.

Shri. A.D. Kahar.

Toxicology :

Assistant Director :

Dr. M.G. Phatak.

Virology :

Senior Scientific Officer (CI -

Dr. (Mrs) R.A. Deshmukh.

Zoonosis :

Senior Scientific Officer (CI - I) :

Dr. B.D. Sathe.

Dr. N.K. Sutar.

Junior Scientific Officer :

Dr. (Mrs) V.R. Kamath.

**Staff of the Haffkine Institute For Training, Research & Testing
1998 - 1999**

Administration**Director :**

Dr. B.G. Khadse. (Addl. Charge)

Chief Administrative Officer :

Dr.S.V. Gadre (From 1-4-98, Addl. Charge)

Accounts Officer :

Shri. A.G. More (From 21-10-97)

Bacteriology :

Assistant Director :

Dr. S.V. Gadre.

Senior Scientific Officer (Cl - II) :

Shri. S.P. Gajbhiye.

Biochemistry :

Junior Scientific Officer :

Vacant

Chemotherapy :

Assistant Director :

Vacant

Junior Scientific Officer :

Shri. K.R. Pawar (till 30-6-98)

Clinical Pathology :

Senior Scientific Officer (Cl - I) :

Dr.(Mrs) Y. Fernandis.

Dr.(Mrs) C.H. Pandit.

Human Pharmacology & Bioavailability:**Radiation Biology & Epidemiology**

Assistant Director :

Dr. N.G. Chanderkar.

Junior Scientific Officer :

Vacant

Immunology :

Senior Scientific Officer :

Vacant

Instrumentation Cell :

Junior Scientific Officer :

Shri. J.V. Savant.

Library

Librarian :

Mrs. M.V. Joshi.

Pharmacology :

Senior Scientific Officer (Cl - I) :

Dr. A.D. Nadkarni.

Junior Scientific Officer :

Transferred to Testing Unit.

Statistics :

Statistician : Shri. A.S. Arekar.

Testing Unit :

Senior Scientific Officer (Cl - I) :

Vacant

Senior Scientific Officer (Cl - II) :

Shri. S.S. Jain.

Junior Scientific Officer :

Shri. L.S. Patil

Dr. S.B. Dholam.

Shri. A.D. Kahar.

Toxicology :

Assistant Director :

Dr. M.G. Phatak.

Virology :

Senior Scientific Officer (Cl - I)

Dr. (Mrs) R.A. Deshmukh.

Zoonosis :

Senior Scientific Officer (Cl - I) :

Dr. B.D. Sathe.

Dr. N.K. Sutar.

Junior Scientific Officer :

Dr. (Mrs) V.R. Kamath.

Shri. K.R. Pawar (from 1-7-98)

Staff of the Haffkine Institute For Training, Research & Testing
1999 - 2000

Administration**Director :**

Dr. B.G. Khadse. (Addl. Charge till 7-7-99)
(From 8-7-1999)

Chief Administrative Officer :

Dr.S.V. Gadre (Addl. Charge)

Accounts Officer :

Shri. A.G. More

Bacteriology :

Assistant Director :

Dr. S.V. Gadre.

Senior Scientific Officer (Cl - II) :

Shri.S.P. Gajbhiye.

Biochemistry :

Junior Scientific Officer :

Vacant

Chemotherapy :

Assistant Director :

Vacant

Junior Scientific Officer :

Transferred to Zoonosis Dept.

Clinical Pathology :

Senior Scientific Officer (Cl - I) :

Dr.(Mrs) Y. Fernandis. (till 30-4-1999)

Dr. (Mrs) R.A. Deshmukh (from 1-5-99, Addl. Charge)

Dr.(Mrs) C.H. Pandit.

Human Pharmacology & Bioavailability:**Radiation Biology & Epidemiology**

Assistant Director :

Dr. N.G. Chanderkar.(till 30-7-99)

(Reappoint. from 1-10-99)

Junior Scientific Officer :

Vacant

Immunology:

Senior Scientific Officer :

Dr. R.J. Rayanade (From 3-12-1999)

Instrumentation Cell :

Junior Scientific Officer :

Shri. J.V. Savant.

Library

Librarian :

Mrs. M.V. Joshi.

Pharmacology :

Senior Scientific Officer (Cl - I) :

Dr. A.D. Nadkarni.(till 30-4-1999)

Dr. S.S. Mahajani

(From: 12-7-1999)

Statistics :

Statistician : Shri. A.S. Arekar.

Testing Unit :

Senior Scientific Officer (Cl - I) :

Dr. S.B. Dholam

Senior Scientific Officer (Cl - II) :

Shri. S.S. Jain.

Junior Scientific Officer :

Shri. L.S. Patil

Shri. A.D. Kahar.

Toxicology :

Assistant Director :

Dr. M.G. Phatak.

Virology :

Senior Scientific Officer (Cl - I)

Dr. (Mrs) R.A. Deshmukh.

Zoonosis :

Senior Scientific Officer (Cl - I) :

Dr. B.D. Sathe.

Dr. N.K. Sutar.

Dr. (Mrs) V.R. Kamath.

Junior Scientific Officer :

Shri. K.R. Pawar (from 1-7-98)

Staff of the Haffkine Institute For Training, Research & Testing 2000 - 2001

Administration**Director :**

Dr. B.G. Khadse. (Till 30-4-2000)

Dr.(Mrs) M.A. Phadke (1-5-99 to 31-1-2001)

Dr. S.M. Sapatnekar. (From: 1-2-2001)

Chief Administrative Officer :

Dr. M.G. Phatak (Till 26-4-2000, Addl. Charge)

Shri. C.S. Chavan (from: 27-4-2000)

Accounts Officer :

Shri. A.G. More

Bacteriology :

Assistant Director :

Dr. S.V. Gadre.(Till 31-3-2000)

(Reappoint. From 20-6-2000)

Senior Scientific Officer (CI - II) :

Shri. S.P. Gajbhiye.

Biochemistry :

Junior Scientific Officer :

Vacant

Chemotherapy :

Assistant Director :

Vacant

Clinical Pathology :

Senior Scientific Officer (CI - I) :

Dr.(Mrs) C.H. Pandit.

Dr. (Mrs) R.A. Deshmukh (Addl. Charge)

Human Pharmacology & Bioavailability:**Radiation Biology & Epidemiology**

Assistant Director :

Dr. N.G. Chanderkar.(till 30-7-2000)

Junior Scientific Officer :

Vacant

Immunology :

Senior Scientific Officer :

Dr. R.J. Rayanade

Instrumentation Cell :

Scientific Officer :

Shri. J.V. Savant.

Library

Librarian :

Mrs. M.V. Joshi.(Till 5-12-2000)

Shri.V.D. Mhapsekar

(From 6-12-2000, Addl. Charge)

Pharmacology :

Senior Scientific Officer (CI - I) :

Dr. S.S. Mahajani

Statistics :

Statistician : Shri. A.S. Arekar.

Testing Unit :

Senior Scientific Officer (CI - I) :

Dr. S.B. Dholam

Scientific Officer (CI - II) :

Shri. S.S. Jain.

Scientific Officer :

Shri. L.S. Patil

Shri. A.D. Kahar.

Toxicology :

Assistant Director :

Dr. M.G. Phatak.

Virology :

Senior Scientific Officer (CI - I)

Dr. (Mrs) R.A. Deshmukh.

Zoonosis :

Senior Scientific Officer (CI - I) :

Dr. B.D. Sathe.

Dr. N.K. Sutar.

Dr. (Mrs) V.R. Kamath.

Scientific Officer :

Shri. K.R. Pawar.

Department of Bacteriology :

Training Activities:

The department is a recognised center for training Post-Graduate students for the M.Sc. in Microbiology (By Papers) of the University of Mumbai. During the review period (1996-2001) the department enrolled and trained 40 Post-Graduate students under this M.Sc. (Part I & II) teaching programme. All the candidates completed the course successfully.

The HOD is a recognized Post-Graduate Teacher for the University of Mumbai for guiding students for their research work leading to M.Sc. (By Research) and Ph.D. in Microbiology of the University of Mumbai. A total of four students obtained M.Sc. degree (By Research) in Microbiology of the University of Mumbai. Three students are currently pursuing their research work in the department for the Ph.D. degree in Microbiology of the University of Mumbai. One student is registered for M.Sc. (By Research) in Microbiology.

Research Activities:

The department continued its research work in the area of studying antibiotic resistance among the enterobacterial strains and the mechanisms involved in it. The following three research projects were undertaken and completed :

1. Drug resistance in *Y. pestis* , the organism that causes plague.

This project was undertaken with the specific view of understanding the mechanisms involved in induction of antibiotic resistance in the strain of *Y. pestis* and studying the pattern of its sensitivity to available antibiotic drugs. The work has provided important information which should be useful in the event of drug resistant strains of the organism emerging in the future.

2. Status of Multi-Drug Resistance in Gram Negative pathogens.

The project was undertaken and completed by studying the pattern of antibiotic resistance in a number of Gram Negative pathogenic strains isolated from clinical materials. The mechanisms involved were studied. The study has provided valuable information which will help clinicians treating antibiotic resistant infections.

3. Synergism between Cefoperazone and Amikacin against resistant strain of Enterobacteria :

This study was undertaken and completed during the period of review. The observations of the study have provided important information on the possible use of a suitable combination of antibiotics to overcome the problems in the treatment of infections found resistant to one or more antibiotics when used alone.

Fellows were also appointed to assist the visiting scientist. The department has undertaken following research projects :

1. Phytochemical and Biological evaluation of an indigenous plant *Couroupita guianensis* :

The plant belonging to the family Lecythidaceae was selected for investigations since it has not been a subject of much detailed investigations, so far. Several extracts were prepared from the dried aerial parts of this plant and were tested for anti-microbial and anti-parasitic activity. Four chemical compounds were isolated from the flowers. One of these was characterized as a stigmaterol. The remaining compounds are being characterized. Similar studies on the extracts obtained from the leaves is in progress.

2 Assessment of nutritional status and biochemical profile in certain paediatric ailments :

The department has initiated a study of determining the nutritional status of children suffering from certain ailments with respect to trace elements (Se and Zn) and antioxidant vitamins (A, C and E) with the view of assessing a possible correlation. Methods for estimation of these elements and vitamins in the biological fluids are currently being standardized.

Research Papers Published :

1. Vahanvala S.J., Golatkar S.G., Rane J.B., Pawar K.R., Ambaye R.Y., Khadse B.G.: Antimicrobial activity of *Couroupita guianensis* Abul. Indian Drugs, 37(7), 343-45, 2000.
2. Rane J.B., Vahanvala S.J., Golatkar S.G., Ambaye R.Y., Khadse B.G.: Chemical Examination of the Flower of *Courupita guianensis*. Ind J Pharm Sci, 63(1), 72-73, 2001.
3. Ambaye R.Y., Golatkar S.G., Vahanvala S.J. and Rane J.B.: Genetic basis of cancer (Review article). Pharma Business, 1(46), 15, 2001.
4. Ambaye R.Y., Golatkar S.G., Vahanvala S.J. and Rane J.B. : Hepatitis B Vaccine (Review article). Indian Drugs, (In press).
5. Golatkar S.G., Kamat V.R., Rane J.B and Vahanvala S.J. : Antiparasitic activity of *Courupita guianensis* Abul. Indian Drugs, 38(2), 102-103, 2001.

Testing Activities :

The department undertook biochemical analysis on blood samples and urinary calculi received from various hospitals, general practitioners and the Institute's own dispensary. A total of 281 tests were carried out during the period 1998 to 2000.

Revenue Earned From Testing Activities :

The department earned a revenue of Rs. 7010/- from its testing activities during the period 1999-2001.

Staff :

The department had the following staff members on its roll from November, 1998 :

1. Visiting Scientist (Officer-in-charge)	One.
2. Post-Doctoral Fellow	One*
3. Senior Research Fellow	Two.
4. Junior Technical Assistant	One.
5. Laboratory Attendant	One.

*The Post-Doctoral Fellow has resigned wef October 2000.

Department of Chemotherapy :

The main activity of the department of Chemotherapy has been to train post-graduate students seeking degrees of M.Sc., Ph.D. (Organic Chemistry), and M.Pharm., Ph.D. (Technology faculty) (Pharmaceutical Chemistry) in the methods of synthesis of new chemical compounds with possible chemotherapeutic activity. The department undertakes synthesis of novel chemical compounds and test them for possible anti-microbial, antifungal or anthelmintic activities.

Training Activities :

During the period under review (1996 - 2001), the following students successfully completed their research work for various post-graduate degrees of the University of Mumbai :

- Number of Students completing Research Work leading to M.Pharm. degree in Pharmaceutical Chemistry, University of Mumbai 9
- Number of Studentd completing Research Work leading to Ph.D. (Tech.) degree in Pharmaceutical Chemistry, University of Mumbai. 2
- Number of Students completing Research Work leading to Ph.D. degree in Organic Chemistry, University of Mumbai. 2

Research Activities :

The major research activity of the department is aimed at training post-graduate students pursuing research work leading to M.Pharm. (Pharmaceutical Chemistry), and Ph.D. (Organic Chemistry and Pharmaceutical Chemistry) degrees of the University of Mumbai. The students are trained in the methods of synthesis of new chemical compounds structurally related to known chemotherapeutic agents and test them for possible anti-microbial activity.

The department carried out following research work during the period of review :

1. Synthesis new chemical compounds and their screening for possible anti-fungal, Anti-bacterial and Anti-tubercular activity.

A total of 340 heterocyclic compounds were synthesized during the period of review. Some of these compounds showed promising anti-microbial activity.

Research Papers Published (1996 - 2001) :

1. Sanjay Palav, Mrs. V.R. Kamath, Barsu Khadse. : Synthesis of 5,6-disubstituted-2-(N,N-dialkyl thiocarbamide) benzothiazoles as potential chemotherapeutic and larvicidal agents. Indian drugs, 34 (7), 407-509, 1997.
2. Anup R. Barde, Anil S. Bobde and B.G.Khadse : Synthesis of 5,6-disubstituted-2-(alkyl/substituted aryl) amine benzothiazoles as potential chemotherapeutic agents. Indian drugs, 35(9), 554-557, 1998.
3. Anup R. Barde, Anil S. Bobde and B.G.Khadse: Synthesis of 5,6-disubstituted-2-(substituted phenyl carboxyamide) benzothiazoles as potential anthelmintic and antimicrobial agents. Indian drugs. 36(8), 506-509, 1999.
4. Bharti Nadkarni, V. Kamat and Barsu Khadse: Synthesis and Anthelmintic Activity of substituted phenyl imidazo (2,1-b) Benzothiazoles. Indian journal of Heterocyclic Chemistry, 9 : 309-310, 2000.
5. Chandrakant G. Bondé, Bharti A. Nadkarni and Barsu G. Khadse: Synthesis of 2-substituted pyrazine derivatives as antibacterial agents". Indian Journal of Heterocyclic Chemistry. 10 : 271-274, 2001.
6. Jaya John, A.S. Bobde and Barsu G. Khadse : Synthesis and antimicrobial activity of 2,4-disubstituted thiazole derivatives containing 1,2,4-Triazole ring system. Indian Journal of Heterocyclic Chemistry, 10 : 295-298, 2001.

Research Papers Presented in Scientific Conferences and Symposia (1996-2001):

1. Sonali D. Wayangankar, A.S. Bobade, B.G.Khadse: Synthesis of 2-(2,4-difluorophenyl)-3-(1H-1,2,4-triazol-1-yl)-propan-2-ol, 1-(substituted phenyl) tetrazoles as potential chemotherapeutic agents. 49th Indian Pharmaceutical Conference, Thiruvananthapuram, Dec. 18-21, 1997.
2. Pallavi S. Kharkar, A.S.Bobade, B.G. Khadse : Synthesis of 3 - substituted amide / carbamate / dialkyl-carbamide-5-nitro-2,1-benzisothiazole as potential chemotherapeutic agents. 49th Indian Pharmaceutical Conference, Thiruvananthapuram, Dec. 18-21, 1997.
3. Sandeep D. Paranjape, A.S. Bobade and B.G. Khadse : Synthesis of N-(substituted) 3,5-triazoleobenzothiazole-sulfonamide/sulphone as potent antitubercular agents. 50th Indian Pharmaceutical Congress, Mumbai, Dec 10-13 1998.
4. Jaya John, Bobade A.S., Khadse B.G. : Synthesis and study of Microbiological activity of pyridine bearing thiazoline moiety. 52nd Indian Pharmaceutical Congress (IPC) Hyderabad Dec. 1-3, 2000.
5. Lokhande tushar N., Bobade A.S. and Khadse B.G. : Synthesis of 4-(pyrrolidine-anilino)-N-substituted aryl/heteroaryl succinimide as antimicrobial and antifungal agents. 52nd Indian Pharmaceutical Congress (IPC) Hyderabad Dec. 1-3, 2000.
6. Kulkarni Yogesh P. Bobade A.S. and Khadse B.G. : Synthesis and Biological activity of 3(4-chlorophenyl)-4-(substituted arylidene) amino-5-mercapto-1,2,4-triazole. 52nd Indian Pharmaceutical Congress (IPC) Hyderabad Dec. 1-3, 2000.

Testing Activities :

The department conducted C,H,N analysis on about 100 commercial samples and conducted FT-IR analysis of 14 samples.

Revenue Earned From Testing Activities :

During the period of review (1996-2001), the testing activities of the department earned a revenue of approx. 30,000/-.

Staff :

The department had following staff on its roll during the review period (1996-2001)

1. Assistant Director (HOD)	One.*
2. Junior Scientific Officer	One.
3. Technician	Two.
4. Junior Technical Asst.	Two
5. Laboratory Asst.	Two.

*The Assistant Director has retired in April 2000.

Since the retirement of the Assistant Director in April, 2000, the training activities of the department have completely ceased as there is no recognized guiding teacher available to register fresh students. The Jr. Sci. Officer is awaiting recognition for guiding students for M.Sc. in Organic Chemistry at the University of Mumbai.

Department of Clinical Pathology :

Training Activities :

The department undertook teaching and training programme for 20 DMLT students each year as per the syllabus recommended by the University of Mumbai, in the subjects of Medical Microbiology and Human Pathology. The course content of the DMLT course comprises of both theory lectures and practical work in the laboratory.

The department of Clinical Pathology is essentially a service department. It offers its laboratory services in the field of clinical diagnostic tests to various ESIS, Govt. and private hospitals in the city of Mumbai and also neighboring areas of the state.

Research Activities :

Since the major activity of the department is to offer clinical laboratory diagnostic services, the research activities are aimed at developing newer diagnostic tests, especially for laboratory diagnosis of infectious diseases. The department is planning to acquire newer technologies and equipment in these areas. The department also has initiated following research projects:

1. Isolation and identification of various anaerobes from wound sepsis.
2. Identification of leptospiral organisms from clinical cases reported in endemic areas.
3. Epidemiological studies on important infectious diseases of epidemic potential.

Testing Activities :

The department offers clinical pathological investigations in following broad areas :

1. Cytological investigations on various body fluids.
2. Routine Haematological Examination of blood.
3. Diagnostic Serology, Bacteriology and Mycology.
4. Histopathological Examination of surgical specimen and biopsies.
5. In-Vitro testing of anti-microbial activity of chemical compounds.

Revenue Earned From Testing Activities :

The department earned a revenue of Rs. 8, 58, 848/- from all its testing activities during the review period of 1996 - 2001.

Staff :

The department had following staff on its roll during the period of review :

1. Senior Scientific Officer (CI - I) One
2. Senior Scientific Officer (CI - II) One
3. Senior Technical Assistant..... One
4. Junior Technical Assistant..... One
5. Laboratory Assistant One
6. Laboratory Attendant Two

Department of Immunology :

The department had no technical staff since the Assistant Director and Head of the Department retired in 1996-97. In 1999, one post of Senior Scientific Officer (CI - I) was filled and the department restarted its activities.

Training Activities :

A Course work in Cell and Molecular Biology was conducted for all the Students and Staff members of the Institute. The department is formulating a similar course in the laboratory techniques in Cell and Molecular Biology to be offered by the Institute to outside candidates who wish to learn these laboratory techniques.

The Senior Scientific Officer and Officer-In-Charge of the Department has applied to the University of Mumbai for recognition as a guiding teacher for M.Sc. and Ph.D. degrees in Applied Biology and is awaiting the decision.

Research Activities :

Since the department was non-functional for a couple of years, the main focus was on reestablishing and restructuring the laboratory facilities. The following activities were undertaken in the year 1999-2000 and 2000-2001.

The Tissue Culture laboratory was established as a core facility of the department, since it will be utilized in most of the experimental procedures that will be employed in the proposed research work of the department. Multiple cell-lines like Vero, Hela, Daudi are grown and stored for future use.

Two students from the department attended workshops on PCR technique and HLA - Typing and Bioinformatics, respectively. This will help in establishing new laboratory techniques in the Institute.

The department has submitted following research projects for funding to various funding agencies :

1. Testing of indigenous candidate SIV / HIV vaccine in macaque / Langur non-human primates. The project will be pursued in collaboration with Prof. M.K. Hoffmann of the New York Medical College, U.S.A. (Submitted for grant of funding to Department of Biotechnology, Govt. of India, New Delhi).
2. Purification and Characterization of West Nile Virus induced factor. (Submitted for grant of funding to the Department of Atomic Energy, Govt. of India, Mumbai).
3. Study of the effect of p14 on HCV replication. (Submitted for funding to the Third World Academy of Science, Italy).
4. Development of Non-Human primate model for Hepatitis C infection. (Submitted for funding to the Department of Atomic Energy, Govt. of India, Mumbai).
5. Identification of p14 secreting cell type. (Submitted for grant of funding to Department of Science & Technology, Govt. of India, New Delhi).
6. Study of the anti-viral mechanism(s) of p14. (To be submitted for grant of funding to the Indian Council of Medical Research, New Delhi).
7. Study of the antiviral spectrum of West Nile virus induced factor. (Submitted for grant of funding to the Indian Council of Medical Research, New Delhi).

Research Papers Published (1996-2001) :

1. Wang, Z.Q., Bapat, A.S., Rayanade, R.J., Dagtas, A.S. and Hoffmann, M.K. (2001). Interleukin-10 induces macrophage apoptosis and expression of CD (Fc gamma RIII) whose engagement blocks the cell death programme and facilitates differentiation. *Immunology*. 102(3) : 331-337
2. Ravi J. Rayanade, K. Banerjee and M.V.N. Shirodkar (2000). Singular Anti-RNA Virus-directed Proteins. *J. Postgraduate Medicine*. 46(3): 164-171
3. Zhi-qin Wang, Harold W. Horowitz, Thorsten Orlikowsky, Beom-Ik Hahn, Valia Trejo, Abhijit S.Bapat, Robert S. Mittler, Ravi J. Rayanade, Soo Young Yang and Michael Hoffmann. (1999). Polyspecific Self-Reactive Antibodies in Individuals Infected with Human Immunodeficiency Virus Facilitates T cell-Deletion and Inhibit Costimulatory Accessory Function. *J. Infec. Diseases*. 180: 1072-9
4. Ravi J. Rayanade, Mackevin I. Ndubuisi, Joseph D. Etlinger and Pravin B. Sehgal (1998). Regulation of STAT 3 and STAT 5 "masking" elicited by interleukin-6 in wildtype p53 containing human hepatoma Hep 3B cell lines. *J. Immunology*. 161: 325-334
5. Mackevin I. Ndubuisi, Kirit Patel, Ravi J. Rayanade, Roberto Romero, Abraham Mittelman, Lester T. May, Pravin B. Sehgal (1998). Abnormalities of Interleukin-6 transport in Blood of Patients with Melanoma Following Active Immunotherapy *J. Immunology*. 161: 494-504
6. Ravi J. Rayanade, Kirit Patel, Mackevin Ndubuisi, Sansar Sharma, Satoshi Omura, Joseph D. Etlinger, Richard Pine and Pravin B. Sehgal (1997). Proteasome and p53 -dependent masking of STAT transcription factors. *J. Biol. Chem*. 272, 4659-62.
7. E. Garcia-Valenzuela, R. Rayanade, J.C. Perales, C.A. Davidson, R.W. Hanson, S.C. Sharma (1997). Axon-Mediated Gene Transfer of Retinal Ganglion Cells *In Vivo*. *J. Neurobiology*. 32, 111-22.
8. Ravi Rayanade, Ling Wang, Dorys Garcia, Kirit Patel, Heng Pan, and Pravin B. Sehgal (1995). Modulation of Interleukin-6- induced Plasma Protein secretion in Hepatoma Cells by p53 Species. *J. Biol. Chem*. 270, 23159-65.
9. Pravin B. Sehgal, Ling Wang, Ravi Rayanade, Heng Pan, and Lola Margulies (1995). Interleukin - 6 type Cytokines. *Annal. New York Acad. Sci*. 762, 1-14.
10. R.J. Rayanade. K. Banerjee and M.V.N. Shirodkar (1994). 'Partial Purification and Preliminary Characterization of Crude Plasma Factor' In: *Virology in the Tropics*. (Rishi *et al*) ed.. Malhotra Publishing Home. New Delhi, India.

Research Papers presented in Scientific Conferences & Symposia (1996 - 2001):

1. Seminar on Role of Cytokines in Cervical Cancer, Cancer Research Institute, Bombay, India. 2000
2. Seminar on Molecular aspects of macrophage differentiation. Haffkine Institute, Bombay, India. 1999
3. Seminar on Modulation of IL-6 induced signaling in hepatocytes by p53, National Institute of Virology, Pune, India. 1998
4. Presented a poster entitled "STAT-masking: a novel indirect mechanism by which p53 regulates interleukin-6 elicited Jak-STAT signalling" at the 17th International Congress

- of Biochemistry and Molecular Biology, San Francisco, U.S.A. 1997.
5. Seminar on "interleukin-6 type cytokines/cell signalling", Grant Medical College, Bombay, India. 1997
 6. Presented a seminar on "Plasma factor : A new antiviral antibiotic" at National Institute of Health, Bethesda, U.S.A. 1997
 7. Presented a seminar on "Modulation of JAK-STAT pathway by p53" at the Johns Hopkins University, Maryland, U.S.A. 1997
 8. Presented a poster entitled "Modulation of interleukin-6 action by p53 species: Temperature-dependence of Stat 3 and Stat 5 levels in Hepatoma cell lines expressing p53-Val-135" at the ASBMB/ASIP/AAI joint meeting, New Orleans, U.S.A. 1996

Testing Activities & Sponsored Research Studies:

The tissue culture laboratory is standardizing methods for In-vitro testing of anti-viral or immunomodulatory activity of drugs. These services will be offered to outside sponsors on payment of testing fees.

Staff :

The department has following staff on its roll since November, 1999.

1. Senior Scientific Officer (CI - I) One.
2. Junior Technical Assistant One.
3. Laboratory Attendant One.
4. Senior Research Fellows Five.

Department of Bioavailability Studies & Pharmacology :

The two departments were functioning separately with skeleton staff of only one Senior Scientific Officer and one Assistant Director of the Epidemiology department. In March 1999 the SSO retired and the department of Pharmacology had no technical staff remaining on its roll. In 1999, the Assistant director of the Epidemiology department also retired. In July 1999, one Senior Scientific Officer (CI-I) was appointed in the Pharmacology department and was also given the charge of the technical work in the department of Bioavailability studies. Since July 1999 both the departments are working under the technical supervision of the SSO in Pharmacology department.

Training Activities:

The officer-in-charge of the Department is also looking after the administrative aspects of the Training activities and University as well as Students related affairs of the Institute.

The Officer-In-Charge of the department is also awaiting recognition as a post-graduate teacher in Applied Biology and Pharmacology at the University of Mumbai.

the department organized a half-day Symposium on " Bioavailability Studies on Drugs : Beyond the Regulatory Requirements " on 10th January, 2001 as a part of the annual "Haffkine Day" celebration. Invited Guest speakers from both, the Academia and the Pharmaceutical Industry participated and over 300 delegates attended.

Contract Research Activities :

The department is essentially a service department offering laboratory services in the area of Bioavailability studies on pharmaceutical formulations and undertaking sponsored studies on behalf of the pharmaceutical industry. In the centenary year of the Institute (in 1999-2000), the laboratory facilities of the department were substantially upgraded by acquiring state-of-the-art analytical equipment like HPLC, HPTLC, UV-Visible Spectrophotometer, Liquid Scintillation Beta Counter and a Gamma Counter. The department now offers capabilities of measuring minute concentrations of most types of drugs in bodyfluids of human volunteers taking part in studies of their bioavailability. Since 1999, the department has undertaken 9 sponsored studies involving comparison of 21 different formulations of drugs.

The department has prepared a plan for development of additional laboratory facilities to enable measurement of pharmacodynamic parameters of drug actions. These facilities will enhance the capabilities and scope of contract research studies being undertaken in the department. The plan proposal has been submitted for grant of funding to the "Drug Development Promotion Foundation" being established under the Union Ministry of Chemicals and Fertilizers, Govt. of India.

The following sponsored "Contract Research" studies were undertaken and completed during the period 1999 to 2001 :-

1. Comparison of the pharmacokinetic profile and bioavailability of Cephalexin after a single oral dose of 500mg from "Ceff - 500" capsules or "Ceff-LA" (Cephalexin + Probenecid) tablets in normal healthy human volunteers. (Sponsor : Lupin Laboratories, Mumbai. May - June 1999. Contract Research Fees received : Rs. 1,50,000/-).
2. Study of the bioequivalence of tablets of alpha-methyldopa ("Axeldopa") in comparison with a reference standard formulation "Alphadopa" after a single oral dose of 250mg in normal healthy human volunteers. (Sponsor : Panacea Biotech, New Delhi. June - July 1999. Contract Research Fees received : Rs. 1,00,000/-)
3. Comparison of the pharmacokinetic profile and bioavailability of Cephalexin after a single oral dose of 500mg from its "Ready-mix" suspension "Ceff-Forte Redimix", "Sporidex-Redimix" or "Sporidex-DS" (Dry Suspension) in normal healthy human volunteers. (Sponsor : Lupin Laboratories, Mumbai. July - Aug. 1999. Contract Research Fees received : Rs. 2,00,000/-)
4. Comparison of the pharmacokinetic profile and bioavailability of Cefaclor after a single oral dose of 500mg from its "Ready-mix" suspension "Rediclor" or a "Dry" suspension dosage form of "Distaclor", in normal healthy human volunteers. (Sponsor : Lupin

Laboratories, Mumbai. July - Aug. 1999. Contract Research Fees received Rs. 1,50,000/-)

5. Comparison of the pharmacokinetic profile and bioavailability of Cefaclor after a single oral dose of 500mg from its conventional dosage form of capsules "Keflor", two new Long-Acting formulations "Eclor-LA" and "Eclor-LA-New" and the Modified-Release tablet dosage form "Keflor-MR", in normal healthy human volunteers. (Sponsor : Lupin Laboratories, Mumbai. Sept. - Dec. 1999. Contract Research Fees received : Rs. 3,50,000 -)
6. Comparison of the pharmacokinetic profile and bioavailability of Cephalixin after a single oral dose of 750mg from its Long-Acting tablet formulation "Ceff-LA" and Sustained-Release formulations "Phexin-BD" and "Sporidex-AF" in normal healthy human volunteers. (Sponsor : Lupin Laboratories, Mumbai. Jan. - April. 2000. Contract Research Fees received : Rs. 3,75,000/-)
7. Study of the bioequivalence of capsules of a combination of Ampicillin and Cloxacillin ("Ami-tek-Plus") in comparison with a reference standard formulation "Baxin", after a single oral dose of 250mg in normal healthy human volunteers. (Sponsor : Panacea Biotech, New Delhi. Feb.-March 2000. Contract Research Fees received : Rs. 1,40,000/-)
8. Comparison of the pharmacokinetic profile and bioavailability of Cephalixin after a single oral dose of 500mg from its New Extended-Release tablet formulation "Ceff-ER500" administered with or without Probenecid 500mg in normal healthy human volunteers. (Sponsor : Panacea Biotech, New Delhi. April - June 2000. Contract Research Fees received : Rs. 1,50,000/-)
9. Comparison of the pharmacokinetic profile and bioavailability of Cephalixin after a single oral dose of 1000mg from its New Extended-Release tablet formulation "Ceff-ER500" administered with or without Probenecid 1000mg in normal healthy human volunteers. (Sponsor : Panacea Biotech, New Delhi. June - Sept. 2000. Contract Research Fees received : Rs. 2,00,000/-)

Revenue Earned From Contract Research Studies :

The total revenue earned (1999 to 2001) from the above mentioned nine contract research studies undertaken on behalf of the pharmaceutical Industry was Rupees Eighteen Lacs Fifteen Thousand (Rs. 18, 15, 000/-).

Research Papers Published (1996 - 2001) :

Since the data obtained from the "contract Research Studies" undertaken is submitted to the sponsors for their internal use or for regulatory purposes, the same can not be published without the consent of the sponsors.

Participation in Scientific Conferences, Symposia (1996-2001):

1. Mahajani, S.S. : Participated in the symposium "Priorities in Biomedical Research" organized by the Maharashtra University of Health Sciences (MUHS) at Nashik, Feb., 2000.
2. Mahajani, S.S. : Development of a non-invasive assay technique for the objective assessment of potency in bioequivalence study of topical formulations of Glucocorticoids. A contribution to the Symposium on "Bioavailability Studies on Drugs : Beyond the Regulatory Requirements" , organized at the Haffkine Institute, Mumbai (10th Jan., 2001).

Staff :

The department has the following staff on its roll :

1. Senior Scientific Officer (CI - I) One.
2. Laboratory Assistant Two.
3. Laboratory Attendant One.
4. Senior Research Fellow Two*

*One Sr. Research Fellow has resigned wef June 2000.

*The Officer-In-Charge of the Testing Unit looks after the administrative matters and supervision of Drug Analysis work in Bioavailability studies.

*One Senior Scientific Officer (CI - II) from the department of Clinical Pathology assists in the work of microbiological assay of antibiotic drugs from body fluids.

Testing Unit :

The "Testing Unit" of the Institute essentially provides chemical testing expertise and services to the State Excise Department of the Govt. of Maharashtra. The Unit is also recognized by the Maharashtra Food and Drugs Administration for testing of bulk drugs and pharmaceutical Formulations. The major work of the department involves analysis of alcoholic beverages like Indian Made Foreign Liquor (IMFL), Beer, Toddy and Country Liquor. The Unit also carries out analysis of Alcohol Denaturants , Bitterants and Colorants used to prepare Ordinary Denatured Spirit (ODS) or Special Denatured Spirit (SDS). The Officer-In-Charge of the Unit is a member of the Technical Advisory Committee for Denaturants for the State of Maharashtra.

The following tables present the year-wise details such as types of samples and their number tested by the Unit and the total revenue earned through the testing charges during the period of review (1996 to 2001) :

Table 1. showing the Nature and Number of Samples tested and revenue earned through testing charges during the period 1996-2001 .

	1996-97	1997-98	1998-1999	1999-2000	2000-01
Nature of Sample	# Tested	# Tested	# Tested	# Tested	# Tested
I.M.F.L	1714	1874	1857	1735	1847
Beer	535	637	1008	1740	1629
Toddy	2842	3922	4607	4290	3883

Country Liquor	-	-	2487	8889	10972
Denaturants, O.D.S., S.D.S., French Polish etc	1843	2288	2415	3042	2935
Drugs	Nil	4	5	Nil	Nil
Others	Nil	Nil	7	161	12
Total	6,934	8,725	12,386	19,857	21,278
TESTING CHARGES RECEIVED (Rs.)	3,38,600	4,80,100/-	9,64,250/-	20,37,075	23,59,600/-

Revenue Earned From Testing Activity :

During the period (1996 to 2001) the Testing Unit earned a revenue of Rupees 61, 79, 625/-.

Staff :

During the period of review, the Testing Unit had the following staff on its roll :

1. Senior Scientific Officer (Cl - I) 1.
2. Scientific Officer (Cl - II) 3.
3. Senior Technical Assistant 4.
4. Asst. Off. Sup. 1.
5. Clerk / Typist 1.
6. Laboratory Assistant 3.
7. Laboratory Attendant 4.

Department of Toxicology:-

The department of is also essentially a "Testing" and "Service" department. During the period of review the department was actively engaged in toxicological testing of commercial samples referred to it by various Govt. and Commercial organizations. The various samples tested comprised of drugs, cosmetics, food additives, dyes, pigments, insecticides & pesticides, industrial chemicals, rubber, latex gloves, plastics, painted containers etc. The department also carried out haematological and serum chemistry analysis on blood samples of human volunteers taking part in the bioavailability studies in the bioavailability studies department of the Institute.

Table 1. Number and Nature of Toxicological Tests performed and Revenue Earned during the period of review (1996 - 2001).

#	Toxicological Test Performed	1996-97	1997-98	1998-99	1999-2000	2000-01
Drugs and Related Products						
1	Oral LD ₅₀ in mice	2	2	3	10	11
2	IV LD ₅₀ in mice	-	-	1	-	-
3	Oral LD ₅₀ in rats	-	1	-	-	6
4	Dermal LD ₅₀ in rabbits	-	-	-	-	1
5	Primary Skin Irritation Test	2	2	3	6	7

6	Mucous Membrane Irritation	3	1	1	1	5
7	Undue Toxicity in mice	-	1	-	1	-
8	Intracutaneous sensitization Test	-	-	1	2	-
Industrial Chemicals						
1	Oral LD ₅₀ in mice	1	2	4	3	2
2	Mucous membrane Irritation	1	1	-	4	1
3	Primary Skin Irritation Test	-	2	2	3	1
4	Painted Container Test	-	-	3	-	-
Cosmetics						
1	Oral LD ₅₀ in mice	-	-	-	3	-
2	Oral LD ₅₀ in rats	-	-	-	1	-
3	Primary Skin Irritation Test	1	-	-	7	1
4	Mucous Membrane Irritation	1	-	-	-	1
Revenue Earned From Tests (Rs)		64,400	78,400	87,300	2,68,300	3, 20, 000

Revenue Earned From Toxicological Testing Activity :

During the period, (1996 to 2001) the Toxicology Department earned a revenue of Rupees 4, 98, 400/-.

Staff :

The department had the following staff on its roll during the period of review :

1. Assistant Director (HOD) One
2. Senior Technical Assistant One
3. Laboratory Attendants Two

Department of Virology :

The department of Virology was started in 1922. The department is actively pursuing training, research and diagnostic testing activities on animal and human retroviruses, biological antiviral substances and epidemiological studies on viral diseases. The department has well equipped tissue culture laboratory for isolation and identification of viruses, which includes a P - III facility for handling deadly viruses like Rabies and HIV. The department is a WHO Surveillance and Reference Center for Viral Hepatitis, Rabies, Influenza and Parainfluenza viruses. The department also carried out the work of the Immunization Clinic and during the period of review (1996 - 2001), a total of 841 persons were administered vaccines viz. Anti-Rabies, Polio, Tetanus toxoid, Triple Vaccine, MMR, Typhoid, and Hepatitis A and B.

Training Activities :

The department conducted annual virology courses for M.Sc., M.D. and Ph.D. students of the University of Mumbai. The HOD of the department is a recognized guiding teacher for the degree of M.Sc. and Ph.D. in Microbiology of the University of Mumbai. The department also conducted Summer Training Course for students from various universities in Maharashtra.

Research Activities :

Four students each are pursuing research work on various aspects of viral diseases, for M.Sc. degree and Ph.D. degree in Microbiology of the University of Mumbai.

The HOD has been identified by the National AIDS Control Organization (NACO) as a resource person for carrying out the National Annual Sentinel Surveillance for HIV infection in the state of Maharashtra and Goa. The surveillance was carried out by visiting 17 centers in the state and the report was submitted to NACO.

Testing and Sponsored Research Activities :

The department conducted ELISA tests for markers (antibodies) of viral diseases like Hepatitis A, B, C, Delta etc., HIV -I & II, Cytomegalovirus, Rubella, Herpes, and Dengue.

The department also conducted Hemagglutination and hemagglutination inhibition tests for Influenza virus and anti-Rabies antibody titration in mouse.

The department conducted in-vivo virus isolation test (NIH Test) on clinical samples and in-vitro (Tissue Culture) test for Herpes 1 and 2 and cytomegalovirus.

The department undertook following specialized tests and sponsored research studies :

1. Virucidal action of water purifiers against enteric group of viruses like Polio I, II and III and Coxsackie B3 and B5 viruses.
2. Pharmacovigilance studies on anti-rabies vaccines (Vero Cell Vaccine, Duck Embryo fibroblast vaccine, PCEC and HDCV).
3. Study of the safety, sterility and potency of FMD Vaccine.
4. Mass Immunization for Hepatitis B for various State & Central Govt. Organizations.
5. Determination of CD4 / CD8 Counts in HIV.
6. Determination of Erythropoietin in anemic patients.
7. Detection of HIV and Mycobacterium tuberculosis by PCR.

Research Papers Published (1996 - 2001) :

1. Akhilesh Bhargava, Ranjana Deshmukh, Tapan Kr. Ghosh, Amlan Goswami, P. Prasanna Raj, S.P. Sudarshan. : Profiles and characteristics of animal bites in India. JAPI, Vol.44, No.1: 37-38, 1996.
2. Akhilesh Bhargava, Ranjana Deshmukh, Tapan Kr. Ghose, Amlan Goswami, P. Prasanna Raj, S.P. Marphatia and M.K. Sudarshan Post Marketing Pharmacovigilance of Purified Vero Cell Rabies Vaccine, Verorab: Indian Experience. Indian J. Comm. Health 2 : 31-35. 1996.
3. Ranjana Deshmukh : Animal models for AIDS pathogenesis and vaccine development. 1997. The Blue Cross Book 8, pp 43. Jan. 1997.

4. S.Das, V.L.Yemul & R.A.Deshmukh : Prevalence and association of HIV and other STDs in 200 persons belonging to a high risk group in central Mumbai. *Venerology* . 11(1) : 19-23, 1998.
5. R.A.Deshmukh & V.L.Yemul. Fatal rabies encephalitis despite post exposure vaccination in a diabetic patient: A need for use of rabies immune globulin in post exposure cases. *JAPI*, 47(5) : 546-547. 1999.
6. Deshmukh R.A., Parulkar N.N., Kulkarni V.M & B.G Khadse : Study of HIV seroprevalence in pulmonary tuberculosis patients with special reference to multidrug resistant mycobacteria. *Iranian Biomedical Journal*, 3 (1,2): 15-21, 1999.
7. Iyer A.V., Ghosh S., Singh S.N. and R.A Deshmukh : Evaluation of three "ready to formulate " oil adjuvants for foot-and-mouth disease vaccine production; *Vaccine*, 19 : 1097-1105, (2000).
8. Khaparde S.D. and R.A. Deshmukh : Report on National Annual Sentinel Surveillance for HIV infection in the state of Rajasthan and Himachal Pradesh. For National AIDS Control Organisation and National Institute of Family Welfare and Health, New Delhi.. 1-24, 1998.
9. Khaparde S.D. and R.A. Deshmukh : Report on National Annual Sentinel Surveillance for HIV infection in the state of Maharashtra and Goa. 1999, 1-42. For National AIDS Control Organisation and National Institute of Family Welfare and Health, New Delhi.
10. Khaparde S.D. and R.A. Deshmukh: Report on National Annual Sentinel Surveillance for HIV infection in the state of Maharashtra and Goa.. For National AIDS Control Organisation and National Institute of Family Welfare and Health, New Delhi. 1-62, 2000.
11. N.N.Parulkar, V.L.Yemul, & R.A.Deshmukh, Study of multidrug resistance mycobacteria in Human Immunodeficiency virus sero-positive pulmonary tuberculosis patients. -*International Journal Of Infectious Diseases*. (In press)

Research Papers Presented at Scientific Conferences, Symposia (1996-2001):

1. Officer-In-Charge: Participated and attended The Indo French Symposium on IMMUNO MODULATION held at National Institute of Immunology, New Delhi on Dec 10, 1995.
2. Officer-In-charge : Attended and participated in the Pre Congress-Symposium on Vaccines at the Edward Jenner Symposium in at the 7th International Congress for Infectious Diseases held at Hong Kong, June 10-1-1996.
3. Officer-In-Charge : Study of multidrug resistant mycobacteria in HIV seropositive patients and TB patients. Presented at the 7th International Congress for Infectious Diseases held at Hong Kong, June 10-1-1996.
4. Officer-In-Charge : Pharmacovigilance study of Verorab antirabies vaccine in 878 patients and 773 veterinary students: Efficacy and safety studies in seven-pregnant-women. Presented at the 7th International Congress for Infectious Diseases held at Hong Kong, June 10-1-1996.
5. Officer-In-Charge : Report of WHO/NICD viral Hepatitis surveillance centre at Chennai, Dec 1996. Presented at the 7th International Congress for Infectious Diseases held at Hong Kong, June 10-1-1996.

6. Ninad Parulekar : Study of MDR mycobacteria in HIV seropositive pulmonary tuberculosis patients. Presented at the Annual Research paper presentation competition organised by Dr.Dhalas Felicitation Fund Association, 1996.
7. Sharmistha Das, V.L.Yemul, Ranjana Deshmukh : Study of 200 persons belonging to high risk groups attending STD clinic at central Mumbai. Presented at XXI National Conference on IASSTD and AIDS, Chennai, 8th-9th Feb 1997.
8. V.M.Kulkarni, V.L.Yemul & R.A.Deshmukh : A study of immune responses to recall antigens in HIV seropositive and seronegative pulmonary tuberculosis patients. Paper presented at XXI National Congress of IAMM at Dr.V.M. Medical College, Solapur, 1998.
9. Mr.Viraj Kulkarni : Study of immuneresponses to recall antigen in HIV seropositive and seronegative pulmonary tuberculosis patients, 1998. (paper was awarded the 1 st Prize).
10. Seminar on Rabies Pre Exposure and Post Exposure Vaccination, organized by Pasteur Merieux Connaught on 5th April 1998.
11. Hepatitis A Vaccine : A new perspective in an old disease : seminar arranged by Hoechst India on 9th July 1998.
12. Intellectual property rights issue in Biotechnology and Life-sciences : Seminar arranged by Dept of Sciences and Technology And DAE at CRI, Parel on 15th Jan 1999.
13. Seminar on "HIV/AIDS and TUBERCULOSIS" at YB Chavan Hall on 16th Jan 99.
14. IUGR Placental Pathology Histiocytes and their role in disease process : seminar at LTMC on 11th Feb. 1999.
15. Newer development in vaccinology : Guest Lecture at the Department of Biotechnology, University of Amravati on 26th Feb 1999. Presented at the symposium held at LTMC, Mumbai on 31 st March 1999.
16. Cytokine Responses in HIV and Pulmonary tuberculosis patients" : Presented at the symposium "HIV- Clinical management perspectives" held at LTMC, Mumbai. 1999.
17. Preparation of foot and mouth disease vaccine using novel oil adjuvants. : Paper presented at the 39th meeting of the Associate Teaching Pathologists and Microbiologists on 30th Jan 1999.

Seminars / Symposia organized by the Department :

1. Seminar on "AIDS /HIV scenario in Maharashtra "was organized by the department on 20th Nov.1998.
2. Seminar on "Modern trends in Vaccines and Plasma proteins" was organized on 19th Dec.1998.

Revenue Earned from Testing and Sponsored Research Activities :

The department earned a total revenue of Rs.8,31,460/- from its testing activities and by undertaking sponsored research studies, during the period of review (1996 - 2001).

Staff :

The department had the following staff on its roll during the period of review (1996 - 2001):

1. Senior Scientific Officer (CI - I) One.

2. Senior Technical Assistant	One.
3. Junior Technical Assistant	One.
4. Senior Research Fellow	Five.
5. Laboratory Assistant	Two.
6. Laboratory Attendant	Two.

Department of Zoonosis :

The department was engaged in research, testing and training programs on parasitic diseases during the period under review. The department pursued its activities with the basic objectives of studying the prevalence, epidemiology, diagnosis, Immunology and vector biology of vector-borne communicable diseases of public health significance.

Training Activities :

The department guided post-graduate students in their research work for M.Sc. and Ph.D. degrees in Applied Biology of the University of Mumbai. During the period of review (1996-2001), students completed M.Sc. (By Research) in Applied Biology and students completed research work for Ph.D. in Applied Biology. At present students are pursuing research work for M.Sc. and Ph.D., respectively.

The department conducted short-term training course in Parasitology and Medical Entomology. During the period of review (1996-2001), a total of candidates attended the training course.

The department also conducted Informative Lectures on Snakes, Parasitology, Medical Entomology and Zoonotic diseases for the benefit of visitors and students from Science, Veterinary and medical faculties coming from different parts of the state and the country.

Research Activities:

1. Plague surveillance study:- Since the report of suspected plague in 1994, in Beed and Latur districts of Maharashtra State, investigations were undertaken in these areas and also in the city of Mumbai as routine surveillance study with the help of local authorities, Mumbai Municipal Corporation and Public Health department of the State. The study was carried out by observing blood smears, culture isolation for *Yersinia pestis* and serological diagnosis of rodents collected from different localities of Mumbai. A total of 641 blood smears of suspected rodents were observed and all samples were found negative for *Y.pestis*. A total of 35 samples of suspected rodent tissues (Liver and Spleen) were studied for culture isolation of *Y.pestis* and all were found negative. A total of 31 blood samples obtained from rodents were tested for Serological diagnosis by PHA test by using F1 plague antigen kit developed by HBPCCL. All were found negative. The results were reported to the concerned health authorities.

Though the suspected plague-like episodes were not found to be actually plague, it is felt necessary to conduct the surveillance study as a precautionary measure and also to understand the present status of Plague in study areas as a part of continued surveillance and control of Plague in India.

2. Malaria: During the record years the resurgence of malaria in Mumbai city and other parts of our state were reported. This may probably be due to both, the parasites acquiring resistance to available drugs and also the vector species of mosquitoes acquiring resistance to DDT, HCH and malathion in some parts of our state. A pilot study was therefore undertaken in collaboration with the Directorate of Health Services, Government of Maharashtra in Raigad district. The study area is adjoining the city of Mumbai and also has varied ecological terrains such as mountains, sea-shore, river, forest, rice fields, industrial zones, remote villages and semi urban towns. The aims of this study were to understand the prevalence of malaria in this area and the vector species e.g. mosquitoes, and the impact of ecological parameters, which are responsible for transmission of the disease over a long period of time and its possible impact on the city of Mumbai.

A total of 212 blood smears were collected from different villages in the study area. Out of these, 12 were found positive for malaria parasites (*Plasmodium vivax* or *Plasmodium falciparum*). The entomological study showed *Anopheles culicifacies* as the vector species in the area. This species has been reported resistant to DDT, HCH and malathion in Maharashtra, Gujarat, Karnataka, Andhra Pradesh and Madhya Pradesh. The study results indicate that a high incidence of the disease in the outskirts of the city of Mumbai may pose a major problem in the thickly populated city. The study is therefore being continued.

3. Guinea Worm: Cyclops control plays a major role for guinea worm control. The ovicidal activity of three indigenous plants was tested against Cyclops i.e. *mesocyclops leuckartisensu lato*, the vector of guinea worm disease under the laboratory conditions. Among the three plant extracts examined, extract of *Embelia ribes* exhibited promising ovicidal activity. The plant *Pongamia pinnata* showed a weak activity, where as no ovicidal activity could be detected in extracts of the plant *Acorus calamus*. Research is also undertaken for developing a serological diagnostic test for the disease using the ELISA technique.

4. Angiostrongyliasis: The department undertook a study of snails and slugs which are a vector of *Angiostrongylus cantonesis*, the causative agents of human eosinophilic meningitis. The third stage larvae of *A. cantonesis* were isolated from different snails in different parts of Mumbai city and were identified as *Achalina fulica laevicaculis* and *Macrochlamys indica*. The prevalence of these in snails and slugs population in Mumbai area is hazardous from public health point of view. The department also undertook a study of the molluscicidal activity of extracts of the herb, *Jatropha curcuss* (Mogali Erand) and found these to be active.

5. Schistosomiasis: The department had undertaken a study on the epidemiological features of the focus of human schistosomiasis at Gimvi Village in the District of Ratnagiri. The identified village is the only focus of human schistosomiasis, highly localized in a small area of the Village Gimvi. There is considerable scope for investigation of this focus, as we, do

not have any idea of about the reservoir of infection in vertebrates as well as mollusca. Some of the questions like persistence of the focus for such a long duration and its inability to spread other to areas still remain unanswered. The work is being continued.

6. **Dengue:** Dengue fever is one of the oldest mosquito borne viral disease prevalent in India. The species of mosquito, *Aedes aegypti* is an important vector transmitting the two varieties of the disease, dengue and dengue haemorrhagic fever. In Maharashtra, the last epidemic of dengue was reported in Nagpur, in 1965 and Miraj in 1986 respectively. Recently, in the year 1997, a suspected outbreak of dengue occurred in five localities in Mumbai City. The entomological survey was conducted in each locality to assess the exact status of *Aedes aegypti* as a vector of the disease. A total of 250 houses were covered in the study area of five localities and a total of 100 containers were found positive for all the larval stages of I, II, III, and pupa of *Aedes aegypti* mosquito vector of dengue.

7. **Purification of Polyantivenin:** The department has undertaken a project for purification of the Anti-Snake Venom Serum by employing the technique of affinity column chromatography using protein G as the matrix. The potency of the purified immunoglobulins would be tested in laboratory animals and compared with the unpurified Antivenin.

Research Papers Published:

1. Bharati Kulkarni, V.R.Kamath and B.G.Khadse : Synthesis and study of antihelminthic activity of substituted Phenyl Imidazol(2,1-b) Benzothiazoles. Journal of Heterocyclic Chemistry V 9 : 309-310, April-June 2000.

Research Papers sent for publication :

1. Bharati Nadkarni, V.R.Kamath and B.G.Khadse Synthesis and study of anthelmintic activity of substituted Phenyl Imidazo (2,1-b) benzothiazoles. Indian Journal of Heterocyclic Chemistry,
2. Golatkar.S.G., Kamath, V.R., Rane, J.B. & Vahanwala S.J : Anti-Parasitic activity of *Courouptica guianensis* Aubl.. Indian Drugs.
3. Bharati Nadkarni, Y.P. Kulkarni, V.R. Kamath & B.G.Khadse : Synthesis and study of anthelmintic activity of a series of Triazolothiadiazines and riazolothiadiazoles. Indian Journal of Pharmaceutical sciences.
4. Khadse B.G., Nadkarni B.A. & V.R.Kamath : Synthesis and study of anthelmintic activity of substituted Benzothiazole Carbamates.

Papers presented at Conferences & Symposia :

1. Saroj Bapna, B.D.Sathe and V.L. Yemul: Ovicidal action of three indigenous plants against *Mesocyclops leuckarti*. Second National Symposium on vectors and vectors borne diseases, Goa (1997).
2. Bapna S, Sathe B.D., and V.L.Yemul : Effect of Altosid on *Mesocyclops Peuckasti* infected with *Dracunculus Medinesis* larvae. National Seminar on Entomology in 21st Century, Udaipur (1998).

3. B.D.Sathe and V.L. Yemul : Entomological Survey carried out during suspected dengue epidemic in Mumbai. Third National symposium on vectors and vector borne diseases. Bhubaneswar (1998).

Testing Activities:

1. **Testing of Insecticidal and Pesticidal activity :** The department undertook the work of evaluating the commercial insecticides and rodenticides for their efficacy against insects and pests of medical importance (mosquitoes, fleas, flies, cockroaches and rodents). In all 94 formulations received from various sponsors were tested for their efficacy.
2. **Testing of anti-malarial activity :** A total of 107 new synthetic compounds were tested for anti-malarial activity in the laboratory model of *P. berghei* in mice.
3. **Testing of Anthelmintic activity :** A total of 82 new synthetic compounds synthesized by the department of Chemotherapy were tested for possible anthelmintic activity in the laboratory model of *H. nana* infestation in mice.
4. **Maintenance of insect colony :** The following insect colonies were maintained in the laboratory for use in various testing procedures : 1. *Culex*, *Anopheles* and *Aedes* species of mosquitoes, 2. *Musca domestica* (house fly), 3. *Xenopsylla cheopis* (fleas) and 4. *Necator americanus* and 5. *Blattella germanica* (cockroaches) under laboratory conditions. The parasitic strains of *P. berghei* and *H. nana* strains were maintained as infestation in mice.

VENOMOUS ANIMAL UNIT :

This unit of the department procured and maintained in its snake-farm the following species of poisonous snakes : 1. *Naja naja*, 2. *Viper a russelli*, 3. *Bungarus caruncleus* and 4. *Echis carinatus*. The unit also procured and maintained scorpions of the species *Buthus tamulus* and *Palamnacus gravimanus*. The unit undertook following activities:

1. Lectures and demonstrations to students and visitors on identification of snakes and techniques for extraction of their venom.
2. Extraction, collection and processing of venom and its supply of venom to HBPCIL and other research institutions in India and abroad.
3. Expert advice on identification of snakes and scorpions.

The following table provides the details of the number of animals maintained and the quantity of venom produced and supplied to various institutions, during the period of review (1996 - 2001).

Snake species	Procurement	Venom produced in (g)	Venom supplied (g)
Cobra	56	140.05	8.87
R. viper	62	33.93	12.80
Krait	11	0.08	1.44
Echis	710	35.21	4.20
Total	839	110.92	27.31
Scorpion species	Procurement	Venom produced	Venom supplied

		(g)	(g)
Red	35336	28.73	5.49
Black	-	-	-
Total	35336	28.73	5.49

Visitors to the Snake Farm:

1. Students	3478
2. Staff Of Scientific Institution	955
3. Distinguish Guests	38
4. Foreign Guests	12
6. Others	88

Total 4571

There were 12 inquiries for identification of snakes from hospitals and Individuals during the period of review (1996-2001).

Revenue Earned From Testing Activities:

A total revenue of Rs. 19, 71, 000/- was earned from the various testing activities during the period of review (1996 - 2001).

Staff:

The following staff was on the roll of the department, during the period of review (1996 - 2001):

1. Assistant Director (Epidemiology)	1
2. Senior Scientific Officer (CI-I)	3
3. Junior Scientific Officer	2
4. Senior Technical Assistant	1
5. Clerk / Typist	1
6. Laboratory Assistant	3
7. Snake Attendant	2
8. Animal Attendant	4
9. Gardener	1

The Library:

During the years under report (1996 - 2001), the library carried out its routine activities of purchase of books, monographs, journals, maintaining their archives and offering services to the staff and students of the Institute as well as persons from other institutes and the industry.

Upgradation of CD-ROM Data Retrieval System :

During the period of review, the library upgraded its computer retrieval system by installing a CD ROM tower with 14 CD drives and a Pentium processor, on to the existing LAN. In order to increase the data-storage capacity, the hard disc space and Ram were upgraded on all nodes in the LAN. The CD tower provides multi-disc and multi-database search facility with just one search strategy. It has provided the users with a choice of selection of databases and their coverage in terms of years, while commencing a search. Being a multi-database search facility, the users are able to combine their search for Medline and Life Sciences databases. The library continued to subscribe to Current Contents with abstracts on Floppy diskettes. These facilities have provided the users with quick and easy search. The information search facility was supplemented by providing INTERNET search facility only to the staff and students of this Institute.

Conversion of Old Archives into Microfiches:

As is known, the library of the Institute is one of the oldest in the city of Mumbai and has collections dating back to 1899; many of these were in irreparable condition. Among these documents, the library identified the oldest and most worn out books and journals that could not further stand the wear and tear of use and the environment. In order to preserve their information content, for the present and future use, the library proposed to convert these documents into microfiches and obtained plan grants from the State Government for the same. This project was carried out in phases. This project commenced in 1997 and was completed in March 1999. During this period, the library converted about 4000 documents into microforms. To provide print copies of the matter on the fiches, the library has installed a Microfiche/film Reader Cum Printer (Canon MP 95) and the same has been put into use immediately.

Total Holding :

Books: till date the library has a total collection of 10,351.

Bound Journals: total collection of bound journals is 25,412.

FACILITIES:

Reprographic Services :

The library provides reprographic facilities to the institute's staff, students and visitors. It continued to receive such requests from not only visitors but also from patrons outside the city. The library received these by fax, e-mail, simple postal request or even by telephone. The library forwarded these requests as per the requirement of the users i.e. by fax, post, or by speed post.

Inter-Library Loan :

The library continued to participate in the resource sharing activities, with other libraries in the city of Mumbai. The library borrowed 62 journals from the neighbouring libraries and

loaned 336 bound volumes to other libraries in the city during the years under report. The year wise break up of this statistics is given in the table 1.

CD-ROM Database Searches :

The students and staff of this Institute frequently use this facility. The library also considered and helped the visitors with search requests. Over the period of years i.e. from 1997, since the installation of CD ROM tower, the number of search requests from the visitors has increased. Hence the library had to keep these requests in queue, and the requests were attended by prior appointment for the use of the system. The details of the searches conducted by the library for the visitors, is shown in the table 1.

Training Activities :

The library participated in the B.L.I.Sc. Degree programme of the SNDT University Mumbai and the SHPT School of Library Science, Mumbai by providing hands-on training of routine activities and automated searches to the two students of the school in each academic year.

Visitors :

About 15,184 visitors, comprising of students, Medical professionals, employees of the pharmaceutical and chemical industries, academicians, Scientists and Researchers of various organizations from Mumbai and also from other parts of the country referred to this library during the years under report.

New Facilities :

The library has been loaning text-books for Std. V to XII and degree colleges to the children of the staff of this institute. The library distributed text-books worth Rs. 4990 and Rs. 3061.00 to 75 students during the years. However, this activity was later moved to the Main Office of this Institute in 1998, as a welfare activity for the employees of this Institute.

The main aim and objective of Haffkine Institute library has been to collect, organize, search and retrieve information in the area of prime activity of the institute, i.e. biomedical and allied subjects with special reference to communicable diseases.

Table showing the statistical data on various activities of the library during the period (1996-2001)

Years	1996-97	1997-98	1998-99	1999-00	2000-01
New Books added	173	172	160	107	83
Journals bound	600	650	357	270	400

Total titles	9,829	10,001	10,161	10,268	10,351
Journals subscribed	135	142	143	144	100
Photo-copying jobs	1,879	1,884	2,437	2,376	2,118
Inter-library loan ~					
Loaned out	100	68	48	89	31
Borrowed in	12	16	17	7	10
Outside Visitors	3,764	5,034	6,390	4,676	7,443
Grants allocated (Rs)	26,62,788	32,11,901	32,17,678	30,43,140	23,55,183

Staff :

During the period of review (1996-2001), the library had the following staff on its roll :

1. Librarian (In-Charge) 1*
2. Assistant Librarian 1
3. Clerk / Typist 2
4. Attendants 3

* Resigned in December 2001.

General Activities :

Training :

Various departments of the Institute provided training and research facilities to the students for studies leading to following Post-Graduate degrees of the University of Mumbai.

1. M.D. in Pathology and Microbiology.
2. M.Sc. (By Papers) in Microbiology.
3. M.Sc. (By Research) in Microbiology, Applied Biology and Organic Chemistry.
4. M.Pharm. in Pharmaceutical Chemistry.
5. Ph.D. in Microbiology, Applied Biology and Organic Chemistry.
6. Ph.D.(Tech.) in Pharmaceutical Chemistry.

The following staff members of the Institute were recognized guiding teachers by the University of Mumbai for the respective degrees and subjects mentioned below.

	Name of the Guiding Teacher	Degree and Subject for which Recognized	Year 1996 1997	Year 1997 1998	Year 1998 1999	Year 1999 2000	Year 2000 2001
1.	Dr. Y.L. Yemul	M.Sc. (Microbiology)	✓	✓	✗	✗	✗
2.	Dr. S.V. Gadre	M.Sc. (Microbiology) Ph.D. (Microbiology)	✓	✓	✓	✓	✓
3.	Dr.B.G.Khadse	M.Sc.,Ph.D.(Org. Chem.) M.Pharm, Ph.D.(Pharm.Chem.)	✓	✓	✓	✓	✓
4.	Dr. S.T. Nikam	M.Sc. (Appl. Biol.) M.Sc. (Biochem.)	✓	✓	✓	✓	✗
5.	Dr.B.D. Sathe	M.Sc. (Appl. Biol.)	✓	✓	✓	✓	✓
5.	Dr.(Mrs) V.R. Kamat	M.Sc. (Appl. Biol.)	✓	✓	✓	✓	✓
6.	Dr. N.G. Chanderkar	M.Sc. (Appl. Biol.)	✓	✓	✓	✓	✗
7.	Dr. N.K. Sutar	M.Sc. (Appl. Biol.)	✓	✓	✓	✓	✓
8.	Dr.(Mrs) R.A. Deshmukh	M.Sc.-(Microbiology) Ph.D. (Microbiology)	✓ ✗	✓ ✗	✓ ✗	✓ ✓	✓ ✓
9.	Dr. (Mrs) C.H. Pandit	D.M.L.T.	✓	✓	✓	✓	✓
10	Dr.(Mrs) Y. Fernandis	D.M.L.T.	✓	✓	✓	✗	✗



14	Mr. Iyer Arun. (Dr. Mrs. R.A. Deshmukh)	Microbiology. (1999)	and Aluminium hydroxide gel adjuvant for Foot and Mouth disease vaccine production
15	Ms. Patil Smita. (Dr. R.A. Deshmukh)	M.Sc. Microbiology. (2000)	Study of the Cytokine profile (IL-2, IFN- γ , IL-4, IL-10, TNF-alpha) in Pulmonary Tuberculosis patients co-infected with HIV.
16	Ms. Wingkar Sharvani (Dr. B.G. Khadse)	M.Pharm. Pharmaceutical Chem. (2000)	Synthesis of organic compounds having possible therapeutic value and preparation of a drug intermediate.
17	Mr. Agnihotri Sagar. (Dr. B.G. Khadse)	M.Pharm. Pharmaceutical Chem. (2000)	Preparation of fine chemicals as useful drug intermediates.
18	Mr. Narkhede Hemant. (Dr. B.G. Khadse)	M.Pharm. Pharmaceutical Chem. (2001)	Synthesis and evaluation of novel heterocyclic compounds of possible therapeutic value.
19	Mr. Chambhare Ravindra. (Dr. B.G. Khadse)	Ph.D. (Tech) Pharmaceutical Chem. (2001)	Synthesis and study of thienopyrimidine and its derivatives as possible anti-bacterial and anti-fungal agents.

Number of students registered at the Haffkine Institute for various degree and diploma courses of the University of Mumbai, during the period 1996 - 2001.

Course/ Degree	Year 1996 - 1997	Year 1997- 1998	Year 1998 - 1999	Year 1999 - 2000	Year 2000 - 2001
M.Sc.(By Papers) Microbiology	5	5	5	5	1
M.Sc.-(By Research) Microbiology	6	2	2	--	1
M.Sc. (By Research) Applied Biology	--	--	--	1	--
M.Sc.(By Research) Organic Chemistry	--	--	--	--	--
M.Pharm Pharmaceutical Chem.	2	2	4	--	--
Ph.D. (Microbiology)	--	2	3	2	2

13	Tech Comp UV/VIS Spectrophotometer	Bioavailability	3.75
14	Remi Refrigerated Centrifuge	Bioavailability	1.25
15	Varian Fluorescence Detector for HPLC	Bioavailability	4.00
16	Dynax Elisa Reader/ Washer	Bioavailability	4.20
17	Bomen FTIR Spectrophotometer	Chemotherapy	9.20
18	Eshica GLC	Chemotherapy	4.55
19	Rota Vapour Evaporator	Chemotherapy	
19	PC Counter Current Chromatograph	Chemotherapy	11.45
20	Amplifier and Microphone System	Durbar Hall	1.45
21	Kodak Slide Projector	Durbar Hall	1.15
22	Liesegang Over Head Projector	Durbar Hall	0.75
23	Liesegang LCD Projector	Durbar Hall	3.60
24	Sorvall 20000 rpm Refrigerated Centrifuge	Instrument Room	14.7
25	Colour Scanner	Library	0.50
26	Kodak Microfilm Reader/Printer	Library	5.80
27	Technicon RA 100 Autoanalyser	Toxicology	10.05
28	Towa Blood Cell Counter	Toxicology	5.00
29	Millipore Water Purifier	Virology	2.25
30	Forma Co2 Incubator	Virology	2.50
31	Biotron Gel-Documentation System	Virology	3.60
32	Labsystems Elisa Reader / Washer	Virology	5.15
33	Ultraviolet Electrophoresis Appartus	Virology	1.70
34	Becton Dickinson FACS Count	Virology	23.7
35	Techne / Cambridge Thermal Cycler	Virology	1.75
36	V.Krishna - 700C Deep Freezer	Virology	1.50
Total Rs. Lakhs			207.35

The Central Instrument Room of the Institute moved to a new and specious space having an area of about 750 sq. ft. in April 1996. Instrumentation Cell carried out the shifting and the re-installation of the instruments in the new location.

The Institute celebrated its Centenary Year from 10th August 1998 to 10th August 1999. Officer- in-charge, Instrumentation Cell, shared the responsibilities as a secretary of the Programme Committee and as a member of the Co-ordinating Committee. Besides the inaugural programme of 10th August, 1998 and the Haffkine Day function of 11th January, 1999, twelve guest lectures / Seminars were arranged during this period. The management of

Durbar Hall and of audio-visual facilities for all these programmes was arranged and supervised by the Officer-In-Charge of the Instrumentation Cell.

Statistics :

The department of Statistics is manned by a single statistician research officer. The statistician helped the research students and scientists of the Institute in their research work in designing experimental protocols and analyzing data, preparation of reports and presentation of data. The statistician conducted training of post-graduate students by delivering lectures on selected topics in biostatistics, research methodology and designing of study protocols.

Participation in scientific conferences, symposia and workshops :

1. Arekar, A.S. : Decision making for statistical treatments of data. Faculty member in the course on "Research methodology, data analysis and statistical treatments", conducted by S.N.D.T. Women's University, Mumbai. 27th Feb., 1997.
2. Arekar, A.S. : Biostatistics in epidemiological studies. Workshop on "Clinical Trials and Biostatistics" organized by Indian Society of Clinical Pharmacology and Therapeutics. Mumbai, Sept., 1998.
3. Arekar, A.S. : Participated in the workshop " Vision Health Care for Street Children" conducted by UNICEF and AAMRAI at T.N. Medical College, Mumbai. August, 1998.
4. Arekar, A.S. : Biostatistics in bioequivalence studies. at the symposium "Clinical trials and Biostatistics" organized by Indian Society of Clinical Pharmacology and Therapeutics. Mumbai, Sept., 1999.

Research papers published :

1. Arekar, A.S.: On incorrect use of Student's "t" test. Current Science, 74 : 1040 - 1043, 1998.

Mr. Arekar was nominated as a statistical referee by the editorial board of the Journal of Association of Physicians of India and the Journal of Postgraduate Medicine. (from 1999).

Dispensary :

A part-time Dispensary continued its work for the staff of the Institute and their family members, in the premises of the campus. The dispensary was open on all working days between 5 to 6 pm. The medical officer-in-charge of the dispensary offered free service to the staff members of the Institute and their families.

