



राष्ट्रीय औषधीय शिक्षा एवं अनुसंधान संस्थान  
National Institute of Pharmaceutical Education & Research  
सैक्टर-67, एस. ए. एस. नगर (मोहाली), पंजाब - 160062  
Sector-67, S.A.S. Nagar (Mohali), Punjab -160062

MINUTES OF THE 79<sup>TH</sup> MEETING OF THE BOARD OF GOVERNORS (BOARD) HELD ON  
22<sup>ND</sup> MARCH, 2023 (WEDNESDAY) AT NIPER, S.A.S. NAGAR (MOHALI)

**Present physically:-**

- |    |   |             |
|----|---|-------------|
| 1. | Dr. Girish Sahni, Former DG, CSIR   | Chairperson |
| 2. | Prof. Dulai Panda, Director, NIPER, S.A.S. Nagar (Mohali)   | Member      |
| 3. | Prof. Bikash Medhi, Department of Pharmacology, PGIMER  | Member      |
| 4. | Mr. Ranga Chandrasekhar, Deputy Drugs Controller (India), CDSCO, Sub Zonal Office, Baddi representing DCGI, MoHFW | Member      |
| 5. | Prof. Arvind Kumar Bansal, NIPER, S.A.S. Nagar (Mohali)   | Member      |
| 6. | Prof. Ipsita Roy, NIPER, S.A.S. Nagar (Mohali)  | Member      |
| 7. | Mr. Jitender Kumar Chandel, Officiating Registrar, NIPER, S.A.S. Nagar (Mohali)                                   | Secretary   |

**Present virtually:-**

- |     |   |        |
|-----|---|--------|
| 8.  | Sh. Rajneesh Tingal, Joint Secretary, DOP, GOI, New Delhi   | Member |
| 9.  | Prof. R.S. Verma, Director, Motilal Nehru National Institute of Technology (MNNIT) Allahabad, Prayagraj   | Member |
| 10. | Dr. Rajesh Jain, Managing Director, Panacea Biotech Ltd., New Delhi                                       | Member |
| 11. | Dr. T. Rajamannar, Executive Vice President, Sun Pharma Advanced Research Company Ltd., Vadodara, Gujarat | Member |
| 12. | Sh. Jagdeep Singh Sidhu, Deputy Director representing Secretary, Technical Education, Govt. of Punjab.    | Member |

The Officiating Registrar & Secretary, Board of Governors (BoG), NIPER, S.A.S. Nagar extended a hearty welcome to the Chairperson and Members, Board, to the 79<sup>th</sup> Board meeting. He apprised the Board that Dr. Meenakshi Sharma, Member, Board intimated that she has an important meeting, which coincides with the instant Board meeting; hence, she shall try her best to attend the Board meeting virtually. The Board noted the information.

Thereafter, the Director of the Institute, with the approval of the Chairman, gave a presentation titled '*Vision for NIPER Mohali*'. The presentation contained the overall research plan of the Institute, the Department wise research plan for the next 3 years, international and new education programs, world-class education, and skill development at the Institute. A copy of the same is attached as **Annexure-1**.

*[Handwritten Signature]*

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The Board appreciated the 'Vision for NIPER Mohali' and noted that research of the Institute is primarily focused on thrust areas of Tuberculosis, Malaria, Diabetes, Leishmaniasis, and Immunomodulation, which the Institute for itself has identified. The Board suggested that Institute should reach out to industry to carry out collaborative research, which could be translated into target-oriented drug discovery and development. The Board also suggested that the Institute should device a strategy to vet the institute funded research projects in consultation with industry experts. Further, the Institute should place a vision document for preparing commercially viable/society relevant projects in line with the Government policy before BoG in the next meeting.

Thereafter, the Agenda was taken up by the Secretary, Board with the permission of the Chairperson, and a point-wise record of deliberations is contained in the following paragraphs:

- 79.1 To confirm the minutes of the 78<sup>th</sup> Board of Governors (BoG) meeting held on 9<sup>th</sup> December 2022.

The Board unanimously resolved that the minutes of the 78<sup>th</sup> Board of Governors (BoG) meeting held on 9<sup>th</sup> December 2022 at the Institute be confirmed. The Board also approved uploading the minutes of its 78<sup>th</sup> meeting on the website of the Institute mutatis mutandis.

- 79.2 To report the action taken on the minutes of the 78<sup>th</sup> Board of Governors (BoG) meeting held on 9<sup>th</sup> December 2022.

The Board noted the information w.r.t. action taken by Institute on its directions and provided specific observations/directions on the following agenda items/action taken report, which are enumerated hereunder:

1. Agenda Item No. 66.5 (78.2.2) w.r.t. NBA or NABL accreditation & academic standard committee report.

The Board noted that in compliance with to the instructions of the Nodal Ministry, the Institute is in the process of establishing a NABL-compliant Testing Lab for Combined Medical Devices. The Director further apprised that Institute is considering NABL accreditation for some of the CIL, NTC, and TDC (API) facilities. In this effort, the Institute is required to seek NABL approval for certain

10/12/22

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parameters (tests) required at Central Instrumentation Lab (CIL). A comprehensive plan on for NABL accreditation of shall be presented to Academic Planning and Development Committee (APDC) in the next meeting of APDC. A presentation on NBA and NAAC shall also be presented to APDC in its upcoming meeting.

The Board resolved that the proposal/agenda placed before the APDC and minutes/recommendations of the APDC on the subject be put up to it exclusively as a separate agenda item for its consideration and decision.

2. Agenda Item No. 78.6 regarding the nomination of the Board's nominees in the Statutory Committees of the Institute as per Statutes.

The Board noted that Dr. Himadri Sen, vide his email dated 13.03.2023, had intimated that due to certain reasons/obligations, he has not been in a position to devote time to the affairs of the Academic Planning and Development Committee (APDC) of the Institute as its Chairperson and submitted resignation accordingly. The Board unanimously accepted the resignation of Dr. Himadri Sen as Chairperson, Academic Planning and Development Committee (APDC).

The Board also approved the nomination of Mr. Srinivas Lanka as the Chairperson of APDC.

3. Agenda item No. 78.16 regarding the Centre for Pharmaceutical Innovation and Entrepreneurship (CPIE) to meet current guidelines of Atal Incubation Centre or Nidhi Incubator Scheme or Bionest Scheme, etc., and Implementation of DoP policy guidelines on innovation and Entrepreneurship.

The Board decided that the registration of CPIE shall be done under Section 8 of the Companies Act, 2013 (Amended Act), erstwhile such registration was covered under Section 25 of the Company Act 1956.

The Board also noted that a table agenda titled 'To consider establishing "Centre of Excellence for Drug Discovery and Drug Development" under section 8 of companies act, 2013 in pursuance to section

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7 (xa) of NIPER (Amendment) Act 2021' has been put up for its consideration. The Board carefully examined whether the CPIE can be incorporated into the proposed Centre of Excellence and only one Section 8 company will suffice for both the purposes.

The institute apprised that the CPIE will cater the need of incubation and innovation centre of the NIPER Mohali only while the Centre of Excellence for Drug Discovery and Drug Development will work along with the DoP to materialize different programs of the department in BIRAC like fashion. Since the objectives of CPIE and the proposed Centre of Excellence are distinctly different, it would be more appropriate if both are registered under Section 8 of the Companies Act, 2013, separately as independent entities. The Board agreed to let CPIE and the proposed Centre of Excellence for Drug Discovery and Development to be established under the Scheme of the Ministry be registered under Section 8 of the Companies Act, 2013.

79.3 To consider the Promotion Policy for Non-Teaching staff of NIPER, S.A.S. Nagar (Mohali).

The Director gave a detailed presentation on the proposed '*Guidelines for Merit Based In-Situ Promotion Scheme for non-faculty staff of the Institute*'. Prof. S.S. Sharma, Chairperson Committee for the formulation of New Promotion Policy, NIPER S.A.S. Nagar, was also present during the presentation.

All the members appreciated the hard work put in by the committee members in drafting this proposal and noted that a promotion policy is needed to boost the morale of the non-teaching employees of the institute. After extensive deliberations, the Board unanimously resolved that the proposed Promotion Scheme should be in sync with government/DoPT guidelines and Recruitment Rules of the Institute considering the sanctioned regular positions. The Chairperson emphasized that since these rules, once notified, will pertain to all NIPERs, a faster decision will be helpful to boost the morale of employees of all NIPERs.

Accordingly, the Board directed the Institute to take care of the points discussed above and place the same before the Finance Committee of the Institute for its consideration and recommendations. Thereafter,

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minutes/recommendations of the Finance Committee can be placed before the Board to be forwarded to DoP for further necessary action.

79.4 To consider the hiring of Young Professionals.

The Joint Secretary inquired about the number of Young Professionals Institutes intends to recruit. It was apprised that the recruitment of Young Professionals shall be on a need basis, especially in the areas of Engineering, Finance & Account, Store & Purchase, Medical Devices and other academic courses, Legal Cell, etc., as per DoP/Niti Aayog guidelines.

Keeping in view the interest of the Institute, the Board unanimously approved the proposed guidelines for hiring Young Professions at the Institute.

79.5 To report Administrative Matters of the Institute.

After thorough deliberations, the Board unanimously resolved to ratify the following administrative matters:-

1. Joining of new faculty members.

**Ratified.**

2. Employees retired between December, 2022 to March, 2023.

**Noted.**

3. Recruitment of Veterinary Officer against Advt.No. 10/2022.

**Ratified.** The Board also unanimously acceded to the proposal to allow the issuance of the appointment letters with the approval of the Director in pursuance to Section 25 (b) of the NIPER Act 1998, which empowers the Director of the Institute to issue appointment letter (s) being the Appointing Authority except for the post of Assistant Professor or above or if the appointment is made on the non-academic staff in any cadre, the maximum of the pay scale for which is the same or higher than that of Assistant Professor.

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4. Welfare measures taken for the employees of the Institute on the Foundation Day-2023 of the Institute.

**Noted & Ratified.**

- 79.6 To consider providing specific directions for a "specific clause of arbitration" (Moa point 14) in the case of Universiti Teknologi Mara (UiTM) Memorandum of Agreement (Moa).

**After brief deliberations, the Joint Secretary, DoP, asked the Institute to forward the agenda/proposal to the Ministry for vetting by the Policy IC division of the Department of Pharmaceuticals, which the Board endorsed in one voice.**

**The Board also noted that previously, the Institute could not execute a few MoUs/agreements with international organizations because of a lack of clarity on this issue. Hence, the Board felt that a broader outlook might be adopted while deciding on the above issue.**

- 79.7 To consider the Pensionary and other service benefits of Sh. K.S. Saini, Ex-Stenographer-B.

**The Board went through the agenda carefully and noted the diverged legal opinions of the empanelled counsels of the Institute and also deliberated upon the exigency to take a final decision on the matter. Considering the diverged legal opinions of the counsels, the Board decided to take a fresh legal opinion from the ASGI, giving the latest developments. The board directed the Institute to take legal opinion from ASGI at the earliest and circulate the same electronically amongst the Board Members for final decision.**

**Simultaneously, the Board also directed the Institute to put up details of legal cases keeping in mind the Government Ideology to minimize the litigation. For this, the Board also directed to strengthen Grievance Redressal Mechanism to avoid litigations as far as possible, which may be presented in the next BOG meeting.**

*Signature*

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79.8 To consider taking the final decision on disciplinary proceedings Under Rule 14 of CCS (CCA) Rules, 1965 against Dr. A.S. Sandhu, Ex. Garden Supervisor concluded after his superannuation.

The Board went through the agenda thread barely. The Board asked the Secretary to read the approved/partly approved charges for the convenience of members virtually attending the meeting.

Thereafter, the Board observed that approved/partly approved charges are grave in nature, particularly the charges pertaining to loss to the Government Exchequer. The Board inquired about the action taken against the former Director. It was apprised that since the services of Ex. Director were terminated with the approval of the Visitor, i.e. the Hon'ble President of India; hence the Institute did not maintain the employee-employer relationship, and disciplinary proceedings could not be initiated against the former Director. Whereas disciplinary proceedings under Rule 14 of CCS (CCA) Rules, 1965 were initiated against Dr. A. S. Sandhu while he was in service, vide Memorandum No. F. No. 1-14(36)/2020/Estt./1167 dated 15.02.2020. It was also apprised by the Institute that it had filed a criminal/police complaint against the former Director for his various acts of omission and commission, which resulted in the loss to the exchequer, and pursuing the same presently.

The Board noted that the Disciplinary Authority had accepted the report of the Inquiry Authority at the relevant point of time.

The Board noted that as per Rule 9(2)(a) of CCS (Pension) Rules, 1972, the departmental proceedings, if instituted while the Government Servant was in service whether before his retirement or during his re-employment, shall, after the final retirement of the Government servant, be deemed to be proceedings under Rule 9 of CCS (Pension) Rules, 1972 and shall be continued and concluded by the authority by which they were commenced in the same manner as if the Government servant had continued in service. Final order under Rule-9 will be issued in the name of President [(Government of India's decision (GID) No. 3 below Rule-9 of CCS (Pension) Rules, 1972 refers.

As per the provisions of Rule-9 of CCS (Pension) Rules, 1972 following three powers are available for the President as regards pension and

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gratuity (refer para 9 of Chater-21 'Post Retirement Proceedings' of 'Handbook for Inquiry Officers and Disciplinary Authorities' issued by DoPT -

- a. Withholding pension or gratuity, or both, either full or in part.
- b. Withdrawing pension in full or in part, whether permanently or for a specified period.
- c. Ordering recovery from pension or gratuity of the whole or part of any pecuniary loss caused to the Government.

Powers under Rule 9 can be invoked "if, in any departmental or judicial proceedings, the pensioner is found guilty of grave misconduct or negligence during the period of service, including service rendered upon re-employment after retirement".

CCS (Pension) Rules, 1972 have been amended as CCS (Pension) Rules, 2021 vide Notification No. GSR 868 (E) dated 20.12.2021. Provisions of Rules-9 of CCS (Pension) Rules, 1972, have been replaced by Rule-8 of CCS (Pension) Rules, 2021. Recently, amendments in Rule-8 of CCS (Pension) Rules, 2021, have been notified vide Notification No. GSR 770 (E) dated 07.10.2022.

Approval of the President shall be required only for ordering withholding/withdrawing pension or gratuity in the case of pensioner who retired from a post for which the President is the Appointing Authority and, in other cases, Secretary of the Administrative Ministry or Department shall be competent to order withholding/withdrawing pension or gratuity, if the pensioner is found guilty of grave misconduct or negligence during the period of service in any departmental or judicial proceedings.

As per Clause 21 of NIPER Statutes, 2003, the employees of the Institute shall be governed by the CCS (CCA) Rules, 1965, as amended from time to time. The Appointing Authority of Dr. A. S. Sandhu was Director, NIPER-SAS Nagar. However, being an autonomous body, BoG, the supreme body of the Institute, may like to take the final decision in the matter.

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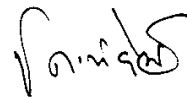
The Board unanimously resolved to recover the full amount Rs. 6,50,000/- from Dr. A.S. Sandhu, preferably the recovery should be made from the Gratuity. The Board deliberated on the quantum of punishment to be awarded to Delinquent Officer. The Board unanimously resolved to withdraw part of the pension for the specified period. The Board noted that as per Rule 9 of the CCS (Pension) Rules 1972 which reads '*...Provided further that where a part of pension is withheld or withdrawn the amount of such pensions shall not be reduced below the amount of rupees Nine Thousand Only (i.e. Minimum pension admissible as per revised rules)*'. The Board decided to reduce 10% of the pension of Dr. A.S. Sandhu, Ex. Garden Supervisor for two years in pursuance to the provisions of Rule-9 of CCS (Pension) Rules, 1972, for his acts of omission and commissions, which resulted in a loss to the Government Exchequer, while discharging the duties of Officiating Registrar at the relevant point of time.

79.9 To consider age relaxation for Departmental Candidates of NIPER, S.A.S. Nagar (Mohali) in Direct Recruitment.

The Board unanimously resolved to extend one-time age relaxation up to 5 years in direct recruitment to the departmental candidates of the Institute in line with the provisions of DoPT OM No. 15012/2/2010-Estt. (D) Dated 27.03.2012 and also in line with approved guidelines approved in other NIPERs.

79.T1 Nomination of the Chairman and one Member in the Selection Committee required to be constituted in accordance with clause no. 3.6 of the NIPER Statues-2003 for the selection of Assistant Professor (Pharmaceutical Management) against advertisement no. 03/2023 and Associate Professor (Medical Devices) to be advertised soon.

The Board approved the nominations of the Chairman, and one Member in the Selection Committee required to be constituted in accordance with clause no. 3.6 of the NIPER Statues-2003 for the selection of Assistant Professor (Pharmaceutical Management) against advertisement no. 03/2023 and Associate Professor (Medical Devices) as proposed in the agenda item.



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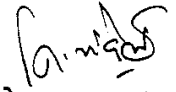
- 79.T2 To consider establishing "*Centre of Excellence for Drug Discovery and Drug Development*" Under Section 8 of the Companies Act, 2013 in pursuance to section 7 (xa) of NIPER (Amendment) Act 2021.

**The board unanimously agreed with the proposal.**

- 79.T3 To table Bilingual Annual Report including annual Statement of Accounts for the period 2021-2022 of NIPER, S.A.S. Nagar (Mohali).

**The Board resolved to adopt and approve the tabled Bilingual Annual Report, including the Annual Statement of Accounts for the period 2021-2022 of the Institute, and directed to forward the same to the Ministry for placing the same before the Parliament in its ensuing session as per usual practice.**

There being no further points, the meeting ended with thanks to the Chair and by Chair to the members.

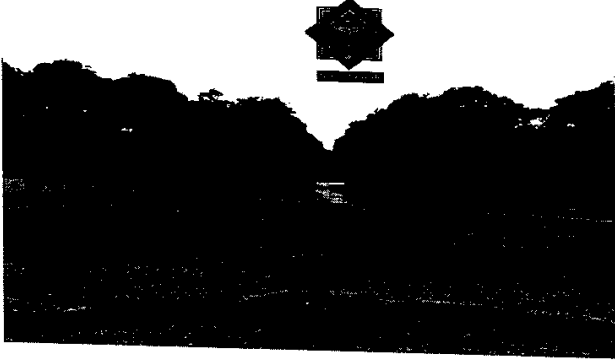
  
(जितेन्द्र कुमार चंदेल)  
कार्यवाहक कुलसचिव

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75 Azadi Ka Amrit Mahotsav

Vision for NIPER Mohali

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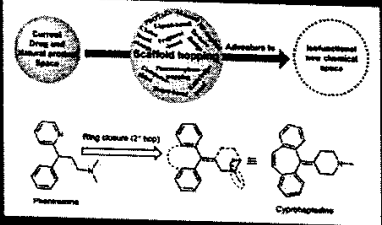
Prof. Dulal Panda  
Director, NIPER Mohali

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Current Research & Information on Pharmaceutical Sciences



Phenazone  $\xrightarrow{\text{Ring closure (1,2 step)}}$  Cyclophosphamide

Scaffold Hopping in Drug Discovery  
Making Grignard reaction safer and cleaner  
A cross-sectional study on pain perception  
CRIPS Digest

National Institute of Pharmaceutical Education and Research (NIPER)  
S.A.S. Nagar

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## NIPER SAS Nagar Data for FY 2022-23

- Publications – 168
- Patents Filed – 13
- Patents Granted – 07
- Masters' degree awarded – 250
- Ph.D. degree awarded – 34

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## Research Plans

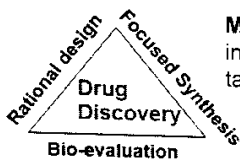
API Development "Reducing API/KSM dependence"	Formulation Development "India as global pharmacy"
Herbal Medicines "Natural product inspired molecules"	Biopharmaceuticals "Recent trend & Future medicines"
Pharmaco-informatics "Artificial intelligence and machine learning in pharmaceuticals"	Clinical and Community Pharmacy "Pharmacovigilance, HEOR and Real world evidence generation"

Institute aims to work with Industry for developing affordable medicines

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**Department of Medicinal Chemistry: Research activities**

**Drug discovery research: Anticancer, Anti-infectious (Antibacterial, Antimalarial, Antituberculosis, Antileishmanial), Neurodegenerative diseases**



**Medicinal chemistry strategies:** Natural Product-inspired, Scaffold-hopping, Choice-based change in target-inhibition

**Computer Aided Drug Design:** Molecular modeling, Quantum mechanics. Analog based design, 3D-QSAR, CoMFA; Computational study

**Synthesis:** NP-based compounds, Analogs of Drugs or Clinical trial agents, Heterocycles, Peptides, Nitreones

**Plans for 2 & 3 year:**

- Antibacterial drug discovery – Targets: FtsZ, beta-Lactamase, DNA gyrase, Topoisomerase IV
- Anticancer drug discovery – Polypharmacology-based (Tubulin, DNA Polymerase)
- Identifications of new molecular motifs as potent bioactive agents
- Molecular-diversity-feasible SAR-enabling synthesis
- Synthesis and mechanistic studies of ultra short neuropeptides, antimicrobial peptides, anti-plasmodial peptides, C-H and C-N functionalization of amino acids
- Peptidomimetic synthesis by catalysis
- Synthesis of new structural classes of anti-plasmodial and anti-tuberculosis agents

## Department of Pharmaceutical Technology Process Chemistry

- Synthesis of oxindoles as key starting material in drugs having good market value and biological potential
- Process Development of 1-(2,6-dichlorophenyl)indolin-2-one as key starting material in NSAIDs
- Scale up of the developed protocol is being carried out in TDC
- Process Development of Antidepressant Drug : Moclobemide
- Scale up of the developed protocol is being carried out in TDC
- New Process Development of Important Drugs and Pharmaceuticals
- Preparing Chiral Analogues of Clemizole
- Exploring the Aromatic Nitro Reduction for Synthesis of Biologically Important Heterocycles

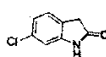
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## Research Plan- 1<sup>st</sup> Year

### 1. Synthesis of oxindoles as key starting material in drugs having good market and biological potential value



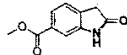
2-oxindole  
(KSM for aemazanib)



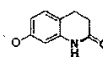
5-chloro-2-oxindole  
(KSM for ziprasidone)



5-fluoro-2-oxindole  
(KSM for sunitinib)



methyl oxindole 6-carboxylate  
(KSM for rintedanib)



7-hydroxy-3,4-dihydrooxindolizin  
(KSM for aripiprazole)

- ✓ Scale up of the developed protocol is being carried out in TDC (Technology Development Centre)

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### Research Plan- 1<sup>st</sup> Year

**2. Process Development of 1-(2,6-dichlorophenyl)indolin-2-one as key starting material in NSAIDS**

1-(2,6-dichlorophenyl)indolin-2-one  $\rightarrow$  Diclofenac  $\rightarrow$  Aceclofenac

✓ Scale up of the developed protocol is being carried out in TDC (Technology Development Centre)

**3. Process Development of Antidepressant Drug : Moclobemide**

Moclobemide

✓ Scale up of the developed protocol to be done in TDC (Technology Development Centre)

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### Research Plan- 2<sup>nd</sup> & 3<sup>rd</sup> Year

**1. New Process Development of Important Drugs and Pharmaceuticals**

Tolmetin  
(NSAID)

Etomidate  
(Anaesthetic)

Letrozole  
(Anticancer)

**2. Preparing Chiral Analogues of Clemizole**

Clemizole

Chiral Analogue of Clemizole

**3. Exploring the Aromatic Nitro Reduction for Synthesis of Biologically Important Heterocycles**

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## Department of Natural Products

- Preventive remedy for diabetes and inflammatory disorders
- Standardization and comparative study of bioactive constituents from several plants for anti-inflammatory disorders
- Development of monographs on selected 6 medicinal plants (AYUSH project)
- Nutraceutical development from *Rhododendron* flowers as a potential anti-obesity agent
- Ayurvedic formulations for anti-SARS-CoV-2 activity
- Ayurvedic Shodhana processes of toxic medicinal plants
- Natural product inspired compounds as antibacterial and protein-aggregation related neurological disorders

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## Research Plan- 1<sup>st</sup> Year

- Preventive remedy for diabetes and inflammatory disorders:
- Natural Products / Nutraceutical, Phytopharmaceutical product development as preventive remedy for alleviating diabetes and inflammatory disorders
    - i. An alkaloid enriched fraction from curry leaves (*Murraya koenigii* (L.) Spreng.) is being developed as a nutraceutical product for Diabetes
    - ii. Immuno-Booster Herbal Tea: Exploring industry partners for commercialization
  - Standardization and metabolite analysis of selected plants using HPTLC/HPLC/qNMR, LC-MS and LC-MS/MS
  - To study chemistry of Ayurvedic Shodhana processes of toxic medicinal plants
  - Stability studies on drugs and drug products as well as herbal formulations

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### Research Plan- 2<sup>nd</sup> Year

**Standardization and comparative study of bioactive constituents for anti-inflammatory disorders**

Sr No.	Name	Family	Common Name	Part used
1.	<i>Boerhavia erecta</i> L.	Nyctaginaceae	Shweta Punarnava	Roots
2.	<i>Boerhavia diffusa</i> L.	Nyctaginaceae	Rakta Punarnava	Roots
3.	<i>Commicarpus chinensis</i> (L.) Heimerl	Nyctaginaceae	Punarnava	Roots

**Development of monographs on selected 6 medicinal plants (as a part of ongoing AYUSH project):**

Sr No.	Name	Family	Common Name	Part used
1.	<i>Volkameria inermis</i> L.	Lamiaceae	Sankuppi	Leaves
2.	<i>Justicia gendarussa</i> Burm. f.	Acanthaceae	Kala Bansa	Stem
3.	<i>Rhododendron arboreum</i> Sm.	Ericaceae	Buransh	Flowers
4.	<i>Physalis minima</i> L.	Solanaceae	Palpottan	Aerial parts
5.	<i>Schleichera oleosa</i> (Lour.) Oken	Sapindaceae	Lichi	Bark
6.	<i>Cleome viscosa</i> L.	Cleomaceae	Hulhul	Seeds

**Nutraceutical development from *Rhododendron* flowers as a potential anti-obesity agent**

- Evaluation of activity of standardized extracts/fractions nutraceutical and phytopharmaceutical products
- To develop methods for usage of leftover fruit material from Seabuckthorn after preparation of fruit oil
- To study chemistry of Ayurvedic Shodhana processes of toxic medicinal plants

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### Research Plan – 3<sup>rd</sup> Year

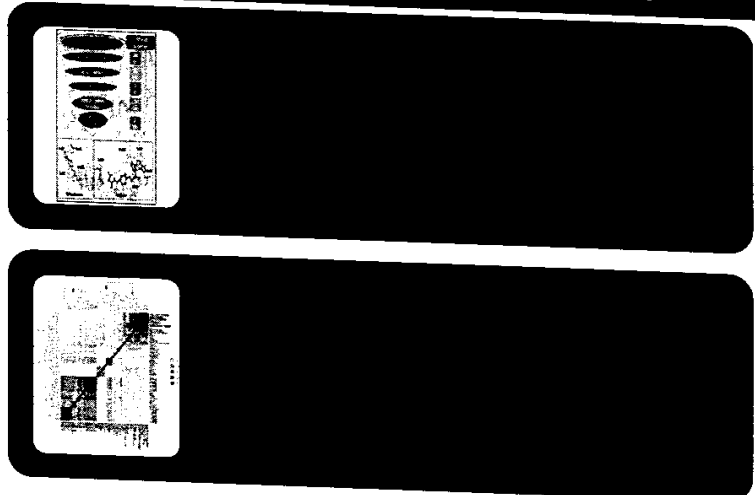
- Ayurvedic formulations for anti-SARS-CoV-2 activity: Phytochemical analysis, quantification, *in-vitro* activity assessment of Ayurvedic formulations for anti-SARS-CoV-2 activity (In collaboration with Shri Dhanwantry Ayurvedic College and Hospital, Sector 46, Chandigarh)
- Evaluation of formulations for bioavailability, stability and toxicity
- Study of Traditional formulations: Phytochemistry, processing methods, chemical changes that occur during processing.
- Molecular/chemical fingerprints with active/major components from formulations

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**Department of Pharmacoinformatics**



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**Establishing a state of the art artificial intelligence/ machine learning laboratory**

**High-end computing infrastructure:**

- *High-Performance Computing Cluster (HPCC)*
- *High end servers for big data research*

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10-05-2023

## Research Plans- 1 and 2 Year

### • First Year

- An image-based multi-class prediction model using Deep Neural Network will be developed for the early diagnosis of gastrointestinal diseases (polyps, esophagitis, ulcerative-colitis, and normal) using colonoscopy images.
- Development of prediction model (AI/ML) for cancer identification using transcriptomics data and perform survival analysis to reveal potential molecular biomarkers.
- a machine learning model to screen out lead molecules for drug discovery.
- The molecular modeling and simulation studies will be carried out to design potent inhibitors targeting elongation factor EF-Tu and EF-Ts of Mycobacterium tuberculosis.
- Computational studies on Protein Degradation in the area of Phosphatases
- Molecular modelling studies to develop less toxic microtubule inhibitors as anti-cancer agents
- Computational studies to inhibit CD47-SIRP alpha interaction and to design anti-CD47 molecules as anti-cancer agents
- Computational studies on SARS-CoV2 variants

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## Research Plan- 3<sup>rd</sup> Year

### • Third Year

- To identify up/down regulating novel genes in cancer using NGS and microarray gene expression data. Further based on the selected overexpressing genes and their proteins, potential drug candidates will be identified via drug-repurposing.
- Prediction model development to classify protease inhibitors using graph neural network (GNN) framework and use different attribution techniques to explain, identify, and visualize vital chemical information in the protease specific inhibitors.

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## Department of Pharmacology and Toxicology

1. Establishing Mitochondrial Pharmacology Laboratory
2. To Study the role of Mitochondrial Associated Membranes proteins in Experimental diabetic neuropathy
3. ER Stress Associated Neuroinflammation in Experimental Diabetic Neuropathy
4. Studying the involvement of mitochondrial dysfunction in disease pathophysiology
5. Studying the role of Exosomes in Diabetic complications
6. Initiating the Anti-Bacterial/Anti TB work at Centre for Infectious Disease
7. Establishing Animal models for Bacterial infection
8. Antibacterial screening and efficacy studies

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## Research Plan – 1<sup>st</sup> Year

1. Establishing the Mitochondrial Pharmacology Laboratory
2. Initiating the Anti-Bacterial/Anti TB work at Centre for Infectious Disease
3. To Study the role of MAM proteins in Experimental diabetic neuropathy

### **Diabetic Neuropathy**

**Specific Objective:** To study various MAMs and ER stress in the pathophysiology of diabetic neuropathy

**Project 2:** Evaluating the role of Exosomes in the pathology of diabetic complications (neuropathy and nephropathy)

**Specific Objective:** To standardize the isolation process of exosomes and optimizing the drug loading

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### Research Plan – 2<sup>nd</sup> Year

1. Establishing Animal models for Bacterial infection and screening in house compounds for antibacterial
2. Studying the involvement of mitochondrial dysfunction in disease pathophysiology

**Major Projects**

**Project 1:** Elucidating Role of Mitochondrial Associated Membranes (MAMs) and ER Stress Associated Neuroinflammation in Experimental Diabetic Neuropathy  
**Specific Objective:** Studying role of pharmacological interventions targeted at MAMs and ER Stress

**Project 2:** Evaluating the role of Exosomes in the pathology of diabetic complications (neuropathy and nephropathy)  
**Specific Objectives:** Characterization of Exosomes in diabetic complications and proteomic profiling

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### Research Plan – 3<sup>rd</sup> Year

1. Antibacterial screening and efficacy studies
2. Studying the role of Exosomes in Diabetic complications

**Major Projects**

**Project 1:** Elucidating Role of Mitochondrial Associated Membranes (MAMs) and ER Stress Associated Neuroinflammation in Experimental Diabetic Neuropathy  
**Specific Objective:** Studying the interaction of MAMs with other established pathways in diabetic neuropathy

**Project 2:** Evaluating the role of Exosomes in the pathology of diabetic complications (neuropathy and nephropathy)  
**Specific Objectives:** studying the effect of exosome on NLRP3 inflammasome activation in diabetic complications

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## Department of Biotechnology

### At a glance

<b>Faculty</b>	Four
<b>On roll</b>	
PhD	26
Masters'	74
Project fellows	02
<b>Graduated</b>	
PhD	45
Masters'	394
<b>Research output*</b>	
Publications	>300
Average IF	4.5
Patents filed	07
Patents granted	05
Extramural grants	>30

\* Current research groups only

Infectious diseases

Basic and applied aspects of infectious diseases biology related to host-pathogen interaction in *Mycobacterium tuberculosis* (Mtb) and *Acetivobacter baumannii*

Protein stability

- Protein characterization during processing
- Stabilization of proteins using aptamers and small molecules
- Protein misfolding diseases

Visceral leishmaniasis

- Drug target identification and validation
- Identifying metabolic enzymes and elucidating its function
- Drug repositioning
- Identification of parasite virulence factors
- Target-specific drug discovery

Protein Biopharmaceuticals

```

graph TD
    A[Protein Biopharmaceuticals] --> B[Anti-inflammatory Biologics]
    A --> C[Anti-cancer Biologics]
    A --> D[Prophylactics]
    B --> B1[Development of broad-spectrum anti-inflammatory peptide (Apo2Frag™)]
    B --> B2[Engineering anti-TNFα antibodies for clinical use (BiotepADab™)]
    C --> C1[Development of broad-spectrum anti-cancer agents (SUSANHAZEN)]
    C --> C2[Development of anti-angiogenic agents (Frasinoids)]
    D --> D1[Prophylactic against malaria agents (MalariaVax™)]
        
```

## Research Plan

<b>Present</b>	Engineering proteins with improved therapeutic properties (efficacy, pharmacokinetic, site-targeting, etc.)
<b>Near future</b>	Development of industrial feasible process (lab-scale) for the production of engineered proteins
<b>Mid-term</b>	Characterization of engineered proteins ( <i>in vitro</i> and <i>in vivo</i> )

<b>Present</b>	<ul style="list-style-type: none"> <li>(i) To identify targets from <i>Leishmania donovani</i> and characterize them biochemically (Targets: Homoserine dehydrogenase (LdHSD), pyridoxal kinase (PdxK) and arginyl tRNA synthetase)</li> <li>(ii) Understanding their role in host pathogen interaction and infection</li> <li>(iii) Screening of calcium-activated potassium channel inhibitors</li> </ul>
<b>Near future</b>	<ul style="list-style-type: none"> <li>(i) CRISPR-Cas9 mediated creation of gene-deletion and overexpression of LdHSD mutants and assessment of their impact on parasite growth, viability and infectivity.</li> <li>(ii) Screening of calcium activated potassium channel inhibitors for antileishmanial efficacy and its mechanism of action</li> <li>(iii) Generation of knockout and rescue cell lines for selected targets</li> </ul>
<b>Mid-term</b>	<ul style="list-style-type: none"> <li>(i) Susceptibility of the <i>L. donovani</i> parasites to HSD inhibitors</li> <li>(ii) Role of PdxK in evoking TH<sub>1</sub> or TH<sub>2</sub> pathway activation in infected macrophages</li> <li>(iii) Screening of calcium activated potassium channel inhibitors for antileishmanial efficacy and its mechanism of action</li> <li>(iv) Analyzing role of arginyl tRNA synthetase in host infection and parasite growth</li> </ul>

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## Research Plan

- |             |  |
|-------------|--|
| Present     | (i) To elucidate the acquisition of iron by the non-canonical pathway previously identified by our group, in these organisms.<br>(ii) To identify and characterize targets involved in host adhesion and invasion i.e. Enolase, GAPDH.<br>(iii) Develop new vectors for the expression of recombinant Mtb proteins since they are notoriously hard to express. |
| Near future | (i) To identify, express and characterize new targets relevant to<br>(a) cell wall synthesis, and (b) cell division<br>(ii) Evaluate drug repurposing as a strategy for novel drug development   |
| Mid-term    | (i) To identify biomarkers/ specific enzyme for diagnostics.<br>(ii) Screening of small molecule inhibitors against selected targets.<br>(iii) To develop antibody or PCR based methods for detection of these organisms.  |

- |             |   |
|-------------|---|
| Present     | Development of aptamers for therapeutic targeting of proteostasis network                       |
| Near future | Identification of initiation stage of protein aggregation for efficacious therapeutic targeting |
| Mid-term    | Development of diagnostic tools for disease biomarkers of low abundance                         |

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## Department of Pharmaceutical Technology Biotechnology

1. Establishment of Cell Culture Facility
2. Fermentation of Therapeutic enzymes and metabolites
3. Projects in Tumor Immunology Immunotherapy
  - Potentiality of LAMP3 and NRP1 as Predictive Biomarker for PD1-Therapy Response in Cancer
  - Understanding RGS5 and Ceramide signaling to improve drug delivery
  - Influence of Type1 Diabetes on Cancer

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### Research Plan -1<sup>st</sup> Year

1. Establishment of Cell Culture Facility
2. Continuation of Fermentation for Therapeutic Enzymes of interest (in collaboration)
3. Initiation of projects in Tumor Immunology Immunotherapy

**A. Genetic Engineering for expression of Therapeutic Enzymes or Metabolites**

Project 1 [Redacted]

**B. Tumor Immunology Immunotherapy**  
Potentiality of LAMP3 and NRP1 as Predictive Biomarker for PD1-Therapy Response in Cancer

Background Research  
Terminally Exhausted (T-TEX) strongly correlates to CSC population and advancement of tumor  
T-TEX-CSCs partnership is not rectifiable by anti-PD1-therapy  
T-TEX induces CSC aggression by LAMP3/NRP1-VEGFR2 axis

Project 2 [Redacted]

**C. Non-Haematopoietic Stromal Cells (Pericyte)**  
Understanding RGS5 and Ceramide signaling to improve drug delivery

Background Research  
Regulator of G protein Signaling 5 (RGS5), a prosopoptotic molecules is upregulated in tumor pericytes  
Tumor pericytes play crucial role in promoting vascular abnormalities, and prevention of drug delivery

Project 3 [Redacted]

### Research Plan -2<sup>nd</sup> Year

1. Continuation of Fermentation of Therapeutic enzymes or metabolites
2. Continuation of projects in Tumor Immunology Immunotherapy

**A. Genetic Engineering for expression of Therapeutic Enzymes or Metabolites**

Project 1 [Redacted]

**B. Tumor Immunology Immunotherapy**  
Potentiality of LAMP3 and NRP1 as Predictive Biomarker for PD1-Therapy Response in Cancer

Project 2 [Redacted]

**C. Non-Haematopoietic Stromal Cells (Pericyte)**  
Understanding RGS5 and Ceramide signaling for improved drug delivery

Project 3 [Redacted]



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### Research Plan -3<sup>rd</sup> Year


Project 1	<ol style="list-style-type: none"><li>1. Continuation of Fermentation for Therapeutic Enzymes of interest</li><li>2. Continuation of projects in Tumor Immunology Immunotherapy</li></ol> <p>[REDACTED]</p> <p><b>A. Fermentation Scale up of Therapeutic enzymes or metabolites</b> <b>B. Tumor Immunology Immunotherapy</b></p> <p>Potentiality of LAMP3 and NRP1 as Predictive Biomarker for PD1-Therapy Response in Cancer</p>
Project 2	<p>[REDACTED]</p> <p><b>Influence of Type1 Diabetes on Cancer</b> Background Research</p>
Project 4	<p>Pre-existing T1DM restricts CD8 +T cell dependent murine melanoma growth By modulating IGF signaling</p> <p>[REDACTED]</p> <p><b>C. Non-Haematopoetic Stromal Cells (Pericyte)</b> Understanding RGS5 and Ceramide signaling for improved drug delivery</p>
Project 3	<p>[REDACTED]</p>

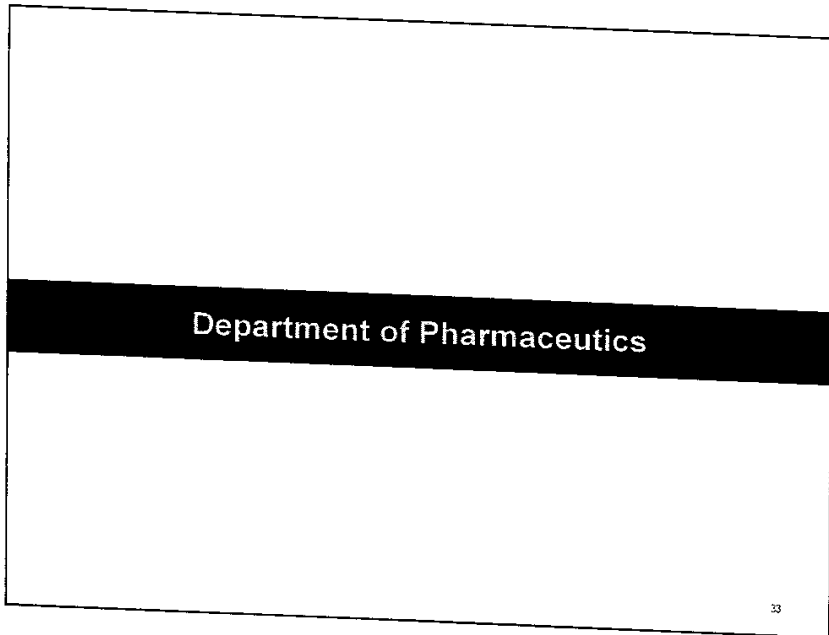
### Department of Pharmacy Practice

1. Research areas: Nephrology and other chronic diseases
2. Health economics & Outcome research (HEOR) research
3. Ground work for the establishment of "Patient Simulation laboratory"

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- 
1. Utilizes manikin(s); and saves the potential harm to human subjects
  2. "Technology-driven" learning solutions to enhance the skills in pharmacy practice students
  3. Representative learnings for pharmacy students-
    - A. Resuscitation Training
    - B. Airway Management Training
    - C. Nursing & Patient Care
    - D. Venous & Arterial Access
    - E. Neonatal Resuscitation Training
    - F. Immobilisation
    - G. CPR training

- 
1. Reduced / zero dependence on hospitals; currently, NIPER pays to PGIMER for the training of pharmacy practice students
  2. *In-house* intensive mentored laboratory work
  3. Could be made available to learners of other institutions
- ### Requirements
1. Dedicated space and manpower
  2. One time upfront investment to make a fully functional facility (could be established in phases!)



### Research Plan -1<sup>st</sup> Year

The content of the slide is organized into a grid of six panels:

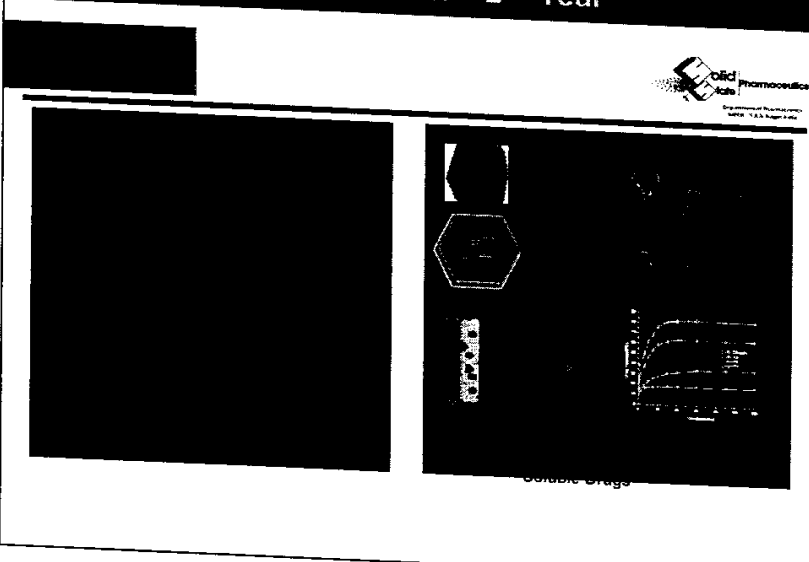
- Top Left:** A panel with a dark background and a grid of small white dots.
- Top Middle:** A panel with a dark background and a white hexagonal shape.
- Top Right:** A panel titled "Lyophilization" with a diagram showing a process flow and the word "Market" below it.
- Bottom Left:** A panel with a dark background and a white circular shape, labeled "Freeze Drying" below it.
- Bottom Middle:** A panel with a dark background and a white circular shape.
- Bottom Right:** A panel with a dark background and a white line graph.

Logo: OICD Pharmaceutics

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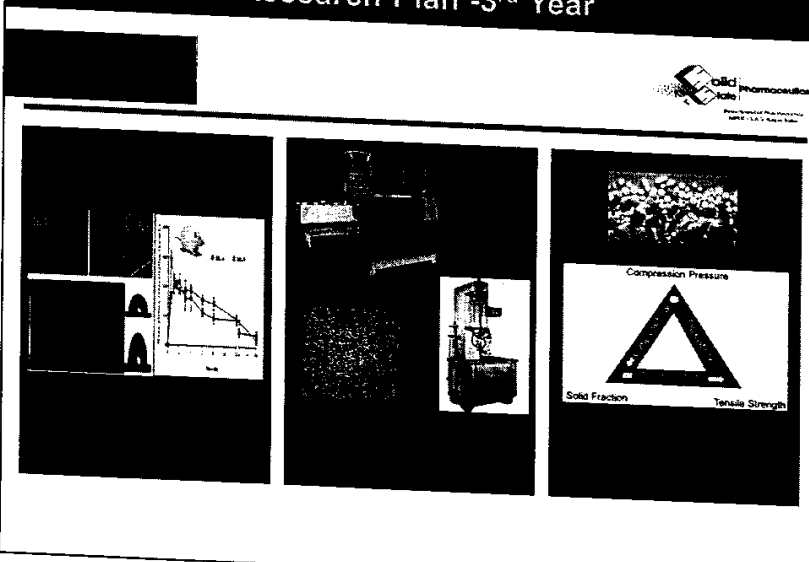
10-05-2023

### Research Plan – 2<sup>nd</sup> Year



The slide features the Oric Pharmaceuticals logo in the top right corner, which includes the text "Oric Pharmaceuticals" and "Department of Pharmaceutical Sciences, Faculty of Pharmacy, Assiut University". The main content area is divided into two panels. The left panel is mostly black with some faint, illegible text. The right panel contains a diagram of a hexagonal tablet with a central logo, a vertical list of text, and a line graph showing multiple curves over time.

### Research Plan -3<sup>rd</sup> Year



The slide features the Oric Pharmaceuticals logo in the top right corner, which includes the text "Oric Pharmaceuticals" and "Department of Pharmaceutical Sciences, Faculty of Pharmacy, Assiut University". The main content area is divided into three panels. The left panel shows a graph with a curve and some text. The middle panel shows a photograph of a tablet and a piece of laboratory equipment. The right panel contains a diagram of a triangle with labels "Compression Pressure" at the top vertex, "Solid Fraction" at the bottom left vertex, and "Tensile Strength" at the bottom right vertex.

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## Department of Pharmaceutical Analysis

### Research Plans 1 & 2 year

- Stability testing of the new and existing drug substances, complex generics and biosimilars
- Impurity profiling of the new drug substances
- Quality assurance and quality survey of top selling Jan Aushudhi drugs
- Identification of likely degradation products (DP) of new drug substances to prevent potential hazards
- Establishment of degradation pathway of new drug substances
- To collect, analyze DPs and metabolites of the drug to monitor adverse drug reaction and to promote patient safety and health of the patents by ensuring the benefits of the use of the drug in compare to risk association with its use

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## Research Plan -3<sup>rd</sup> Year

- Validation of the stability-indicating power of the analytical procedures used based on ICH guidelines to ensure a robust, resilient, transparent, accountable and citizen-friendly drugs regulatory framework and regulatory systems
- Devising stabilization protocols of protein formulation
- Troubleshooting problems for small startup pharmaceutical companies for testing new drug substances by setting up a NABL accredited pharmaceutical analysis lab
- Make a comprehensive synergistic approaches for building robust and resilient regulatory systems drug regularity framework that will meet the requirements of the next 25 years

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## Department of Pharmaceutical Management

### Plans for the next 3 years

1. The Department would like to upgrade the course structure at par with international business schools and would like to incorporate the new specialisation in the course structure.
2. The department would make effort and encourage the students to take the live project assignments from the industry. This will be a value addition to students and will be in addition to their summer internship.
3. Expand the academic activities of the Department by starting EXECUTIVE MBA for working professionals.
4. Wants to start training courses for Industry people
5. Would like to create Pharmaceutical Management Department as Research Centre

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## World Class Education & Skilling at NIPER

- To create a pharmaceutical education ecosystem of international repute
- Education programs as per the societal needs, industry demands and global trends
- Flexibility in learning with provision of major and minor degrees
- Key focus on the analytical and soft skills

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### International & New Education Program

- Promoting "Study in India" initiative of Gol and making NIPER Mohali as the global campus for Pharmaceutical education
- ITEC countries students will be approached to begin with
- Joint education programs with top universities in research and education
- Academic activities of the Institute should be divided into four major schools/disciplines and elective credit courses in third and fourth semesters
- Short-term courses on medical devices for MSMEs (as per budget 2023-2024)

**Ongoing Initiatives:**  
M. Tech in Biopharmaceuticals  
Medical devices degree and diploma  
International students masters and doctoral programs

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