Seed money for Research

Need:

Research needs investment of time and money to take a shape in a higher educational institution. In the context of extreme competition for funding from government and private agencies, it is essential for the institution to support anddevelop their members of faculty to equip themselves with constructive foundationand support for applying for funding as well as publishing in reputed journals.Hence, seed money helps the members of faculty to do some bench work and create basis for a solid and extended proposal to the external funding agency.

Objectives:

- To provide financial support to the members of faculty for undertaking minor research work.
- To support faculty with a small and reasonable grant with which they can jump start their research work.
- To encourage members of faculty to conduct sufficient research work for obtaining 'proof of concept' or 'proof of experience', which further enables them to apply to external public and private funding agencies.

Eligibility:

- All full-time members of faculty of the institution are eligible for this grant.
- The proposed area of research must be novel and very little work have been done.

Process:

- Interested faculty must submit their proposal in the detailed format to the principal.
- The principal refers the proposals to the Research Advisory Committee for scrutiny and review of the proposal.
- Faculty of the institution can collaborate and submit a proposal with one of the masthe principal investigator and other members as co-investigators.

- Only one proposal can be submitted by a faculty per year
- The principal investigators of the shortlisted proposals will be called for a presentation
- There port of the Research Advisory Committee will be released with the final selected proposals
- The rejected proposals can be reworked for resubmission based on the comments/suggestions of the Research Advisory Committee
- All approved proposals will be given a letter of sanction indicating the amount sanctioned and permitted duration of thework
- Quarterly review of the work shall be conducted to monitor the progress made
- After completion of the proposed work, a completion report along with utilization of sanctioned grant should be submitted.
- If possible and sufficient, the results of work should be sent for a publication or apply for a patent.
- Also, the work should be developed further into a full and standard proposal for applying to a public or private funding agency.

Note:

- This grant should not be used for the PHD work of the faculty.
- This grant cannot be used for attending or conducting conferences and workshops or for payment of registration fee.
- Books, equipment, stationery, furniture procured under the Seed Money Grant shall be the property of the Institution.
- Any intellectual property generated during the course of such a project shall be subjected to IPR policy of the institution.

Dr. M.Mohan Babu M.Tech, Ph.D
Principal

Research and Development Cell **Date: 10-07-2023**

File No.: SVCET/R&D Cell/ SEED MONEY/ 2023-24/IT/001

To,

Dr.J.VELMURUGAN,
Professor,
Department of Information Technology
SVCET, Chittoor

Sub: Letter of sanction
Dear Dr.J.VELMURUGAN,

The Management of Sri Venkateswara College of Engineering and Technology appreciate your efforts in submitting your proposal titled **"Computational Investigations Into The Diagnosis And Development Of Drugs For Triple Negative Breast Cancer"** seeking seed grant. After thorough scrutiny, the Research Advisory Committee of the Institution has selected and recommended your proposal for the sanction of **Rs 75,000/-** to work for a period of **one** year.

This seed money grant is provided so as to enable you to undertake preliminary research work which can result either in a 'proof of concept' or 'proof of experience'. Further you are expected to apply to external funding agencies (both public and private) to take the outcomes of this project to its intended goal.

You are expected to submit progress report once in six months and also the final completion report with the utilization certificate within a month of the completion of the project.

The work done under this project shall be used only for the benefit of the institution and it will not be used or transmitted to anywhere else. The conditions for the conduct of this work will be as per the Seed Grant Policy of the institution.

Wishing you good luck

Sri Venkateswara College of Engineering & Technology * CHITTOOR.

Principal

PRINCIPAL
S.V. College of Engineering & Technology, CHITTOOR. (A.P.)

SVCET (FY 2023-24)
Sri Venkateswara College of Engg & Tech
RVS Nagar, Chittoor 517127 AP
E-Mail : info@svcetedu.org

Payment Voucher

No. : **3826**

Dated : **10-Jul-23**

Particulars	Amount
Account :	
Research and Development New Ref Dr.J.VELMURUGAN, 75,000.00 Dr	**75,000.00**
Through :	
Cash	
On Account of :	
being seed money for titled "Computational Investigations Into The Diagnosis And Development Of Drugs For Triple Negative Breast Cancer" seeking seed grant.for one year	
Amount (in words) :	
Indian Rupees Seventy Five Thousand Only	
	₹ 75,000.00

Receiver's Signature:

Authorised Signatory

Prepared by

Checked by

Verified by

Sri Venkateswara College of Engineering & Technology (Autonomous)
R.V.S. Nagar, Tirupati Road, Chittoor – 517127. Andhra Pradesh.
(Accredited by NAAC and NBA)

UTILISATION CERTIFICATE FOR INSTITUTE FUNDED SEED GRANT

Certified that out of **Rs 75,000 (Rupees Seventy-Five Thousand only)** of institute funded seed grant for the project titled "**Computational Investigations into The Diagnosis and Development of Drugs for Triple Negative Breast Cancer**" sanctioned during the Academic Year **2023 - 2024** in favour of **Mr/Dr. J. VELMURUGAN** from the **Department of Information Technology** dated **10/07/2023**, the entire amount has been utilized for the purpose for which it was sanctioned.

Signature of Principal Investigator

Date: **24-06-2024**

ACCOUNTS OFFICER,
S.V. College of Eng & Technology
CHITTOOR.

Signature of Accounts Officer

Date: **24-06-2024**

Signature of Head of the Institution

Date: **24-06-2024**

PRINCIPAL
S.V. College of Engineering &
Technology, CHITTOOR. (A.P.)

Sri Venkateswara College of Engineering and Technology

(Autonomous)

R.V.S. Nagar, Chittoor – 517 127

Date: 24-06-2024

PROJECT COMPLETION CERTIFICATE

This is to certify that the project titled **"Computational Investigations into The Diagnosis and Development of Drugs for Triple Negative Breast Cancer"** has been successfully completed under the institute-funded seed grant.

The project was sanctioned in the Academic Year **2023 – 2024** in favour of **Dr. J. Velmurugan** from the **Department of Information Technology** and was carried out as per the approved objectives and guidelines. The allocated funds have been utilized effectively for the intended purpose, and all necessary reports and documentation have been submitted.

Signature of Principal Investigator

Date: **24-06-2024**

Signature of Head of the Department

Date: **24-06-2024**

Head of the Department
Information Technology
Sri Venkateswara College of
Engineering & Technology (Autonomous)
Chittoor.

Sri Venkateswara College of Engineering & Technology (Autonomous)
R.V.S. Nagar, Tirupati Road, Chittoor – 517127. Andhra Pradesh.
(Accredited by NAAC and NBA)

Project Completion Report

1. Project Title: Computational Investigations into The Diagnosis and Development of Drugs for Triple Negative Breast Cancer

2. Principal Investigator (PI) Details: Dr. J. Velmurugan

3. Department: Information Technology

4. Funding Source and Sanction Details:

- **Funding Source:** Institute Funded Seed Grant
- **Sanction Date:** 10th July 2023
- **Grant Amount:** Rs. 75,000/-
- **Academic Year:** 2023-2024

5. Project Duration: From 10-07-2023 To 24-06-2024

6. Objective of the Project:

This research aims to utilize computational techniques to improve the diagnosis and development of drugs for Triple Negative Breast Cancer (TNBC). By identifying molecular markers, predicting drug interactions, and modeling TNBC pathways, the study seeks to enhance treatment strategies.

7. Scope and Significance:

TNBC is an aggressive breast cancer subtype lacking targeted therapies. This study explores computational methods to:

- Identify biomarkers for improved diagnosis.
- Predict drug-protein interactions using molecular docking.
- Accelerate drug discovery through predictive models.

The research aims to contribute to better diagnostic tools and targeted treatments.

8. Methodology and Implementation:

1. **Data Collection:** Extract data from TCGA, GEO, and DrugBank for TNBC profiles and drug candidates.
2. **Data Analysis:** Use statistical tools and machine learning models to identify biomarkers.

3. **Molecular Docking:** Conduct virtual screening of drug candidates against TNBC protein targets.
4. **Molecular Dynamics Simulations:** Simulate stability and conformational behavior of drug-protein complexes.
5. **Predictive Modeling:** Train machine learning models to predict drug effectiveness and toxicity.
6. **Validation:** Compare results with clinical data for accuracy assessment.

9. Work Completed: Yes

10. Key Findings and Results:

- Identified novel biomarkers linked to TNBC progression.
- Discovered promising drug candidates with strong binding affinity and stable interactions.
- Developed predictive models demonstrating high accuracy in forecasting TNBC drug responses.

11. Outcomes and Deliverables:

- List of TNBC biomarkers for diagnostic use.
- Identified drug candidates with detailed interaction profiles.
- Predictive models for TNBC treatment outcomes.
- Documentation for clinical collaboration and further research.

12. Challenges Faced (if any) and Solutions:

- **Data Availability & Quality:** Limited TNBC-specific data can hinder accuracy. Solution: Use public databases like TCGA and GEO; apply data cleaning and augmentation techniques.
- **Molecular Complexity:** Identifying drug targets in TNBC is challenging. Solution: Use feature selection, molecular docking tools (e.g., AutoDock), and network analysis.
- **Computational Resource Limits:** Heavy simulations may require more power. Solution: Optimize algorithms, leverage cloud platforms, and use parallel processing.
- **Software Learning Curve:** Complex tools may slow progress. Solution: Use GUI-based tools like PyRx and Chimera; invest in targeted training.
- **Drug Resistance & False Positives:** Risk of ineffective candidates. Solution: Use ensemble learning, cross-validation, and ADMET analysis.
- **Experimental Validation:** Lab testing can be costly. Solution: Prioritize in silico screening and collaborate with experimental researchers.
- **Ethical & Regulatory Compliance:** Data security is crucial. Solution: Follow HIPAA/GDPR guidelines and ensure encrypted storage.

13. Utilization of Funds:

- Software Licenses & Tools - Molegro Virtual Docker (MVD)
- Data Acquisition & Storage

- Bioconductor (R-based) – For genomic data analysis.
- Cytoscape – Excellent for visualizing molecular interaction networks.
- WEKA – Machine learning toolkit for cancer classification tasks.

- Cloud Computing Resources - Google Colab Pro

14. Conclusion and Recommendations:

Computational techniques show great promise in enhancing TNBC research. Identified biomarkers and candidate drugs present strong potential for improving treatment outcomes. Future steps should focus on:

- Experimental validation of drug candidates.
- Expanding data integration for deeper TNBC insights.
- Collaborations with medical institutions for clinical advancements.

Signature of Principal Investigator

Date: **24-06-2024**

Signature of Head of the Department

Date: **24-06-2024**

Head of the Department
Information Technology
Sri Venkateswara College of
Engineering & Technology (Autonomous)
Chittoor.