

Report
on
Monthly Faculty Lecture

Series	October, 2025-26
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Date: 29th October, 2025; Time: 2:00 PM

Title: Genetic Risk Factors Associated with Alzheimer's Disease

On 29th October, 2025 the Monthly Faculty Lecture was held under the aegis of Swami Vivekananda University at NND block, Room No: 307, where **Prof. (Dr.) Subrata Kumar Dey, Vice Chancellor, Swami Vivekananda University, West Bengal** delivered an insightful lecture on the crucial topic of " Genetic Risk Factors Associated with Alzheimer's Disease " The event was graced by the presence of SVU officials, directors of various departments, faculty members, staff, and research scholars, making it a significant gathering of academic and professional minds.

Introduction

The session commenced with an opening address by **Prof. (Dr.) Ranjan Chakrabarti, Director, Research & Academic Development, SVU**, who highlighted the significance of understanding genetic risk factors in neurodegenerative diseases, particularly Alzheimer's disease. He also emphasized that with the global rise in dementia cases, genetic and molecular insights have become crucial in developing targeted therapies and preventive strategies. The event was chaired by Prof. (Dr.) Anuradha Mukhopadhyay, Director, School of Science, Swami Vivekananda University, Former, Vice Chancellor, Diamond Harbour Women's University, West Bengal.

The distinguished lecture was delivered by **Prof. (Dr.) Subrata Kumar Dey, Vice Chancellor, Swami Vivekananda University**, an eminent scholar and researcher in the field of molecular biology and genetics. His session, titled "*Genetic Risk Factors Associated with Alzheimer's Disease*," provided a comprehensive exploration of the molecular mechanisms, genetic predispositions, and pathological processes underlying AD. The talk was well-attended by faculty members, researchers, and postgraduate students from various disciplines, reflecting a deep institutional interest in biomedical and genetic research.

Prof. Dey began by contextualizing the topic within the broader framework of neurodegenerative disorders, underlining that Alzheimer's disease remains one of the most pressing medical and social challenges of the 21st century. With no definitive cure currently available, understanding its genetic foundation represents a promising avenue for early diagnosis and intervention.



Key Highlights of the Lecture

1. History and Background of Alzheimer's Disease

Prof. Dey opened his lecture with a brief historical account of Alzheimer's disease. He recounted how the German psychiatrist and pathologist Dr. Alois Alzheimer first described the disease in 1906, based on his observations of a patient named Auguste Deter, who exhibited progressive memory loss, disorientation, and behavioral changes. Through postmortem analysis, Dr. Alzheimer discovered distinctive brain abnormalities—specifically **amyloid plaques** and **neurofibrillary tangles**—which became the hallmark features of the disease.

Citing recent epidemiological data, Prof. Dey noted that **an estimated 8.8 million Indians** currently live with dementia, with a significant proportion suffering from Alzheimer's disease. The condition predominantly affects older adults, typically manifesting after the age of 60. He explained that the **risk doubles every five years after 65**, and nearly **half of all individuals over 85 years** may have the disease. These statistics underscored the growing public health burden posed by AD in aging societies.

2. Understanding Alzheimer's Disease

Alzheimer's disease, Prof. Dey explained, is an **irreversible, progressive neurodegenerative disorder** characterized by the gradual destruction of neurons responsible for memory and cognition. It is a **multifactorial disease**, involving a complex interplay of genetic, environmental, and lifestyle factors.

He elaborated on the biological underpinnings of the disease, emphasizing the formation of **amyloid plaques**—abnormal clumps composed of amyloid-beta protein—and **neurofibrillary tangles**, which are twisted fibers of **tau protein**. These pathological aggregates disrupt neuronal communication, leading to synaptic loss, reduced neurotransmitter activity, and eventually, **neuronal death** in critical regions of the brain such as the hippocampus and cortex.

Prof. Dey also discussed how the **decrease in neurotransmitters**, particularly acetylcholine, contributes to the cognitive decline characteristic of AD. He reinforced that the disease's progression involves both structural and biochemical deterioration of the brain, rendering even basic tasks increasingly difficult for affected individuals.

3. Warning Signs and Clinical Features

To build clinical awareness among the audience, Prof. Dey outlined the seven key warning signs of Alzheimer's disease:

1. Memory loss affecting daily activities
2. Difficulty performing familiar tasks
3. Problems with language and communication
4. Disorientation in time and place
5. Poor or decreased judgment

6. Changes in mood or behavior
7. Alterations in personality

He emphasized that while these symptoms often appear mild at first—such as forgetfulness or confusion—they gradually worsen, leading to complete dependency in advanced stages.

4. Risk Factors Associated with AD

Transitioning to the main theme of the session, Prof. Dey delineated the **major risk factors** associated with Alzheimer's disease. He classified them into **non-modifiable** and **modifiable** categories:

- **Non-modifiable factors:**
 - **Age:** The most significant risk factor.
 - **Genetics and family history:** A strong hereditary component linked to specific gene variants.
- **Modifiable factors:**
 - **High blood pressure, obesity, diabetes, brain trauma, and high LDL levels** were identified as contributing to disease onset and progression.
 - **Oxidative stress**—resulting from an imbalance between free radicals and antioxidants—was also cited as a central player in neuronal damage.

Prof. Dey stressed that while aging cannot be prevented, lifestyle and metabolic factors can be managed to reduce susceptibility.

5. Hypotheses on the Origin of Alzheimer's Disease

The speaker discussed several scientific hypotheses explaining the molecular origins of AD, focusing on two major ones:

- **Amyloid and Tau Hypothesis:** These propose that the accumulation of amyloid-beta plaques and hyperphosphorylated tau protein disrupts neuronal structure and communication, leading to widespread neurodegeneration.
- **Oxidative Stress Hypothesis:** Chronic oxidative stress damages cellular components, including DNA and mitochondria, thereby accelerating the progression of neurodegeneration.

Prof. Dey emphasized that these mechanisms are interrelated, forming a vicious cycle that culminates in neuronal death.

6. Genetic Risk Factors of Alzheimer's Disease

This section formed the **core of Prof. Dey's lecture**. He presented compelling insights into the **genetic architecture** of Alzheimer's disease, supported by extensive research findings.

A total of **695 genes** distributed across **all 46 human chromosomes** have been associated with AD, alongside nearly **3,000 polymorphisms** reported globally. Among these, several genes play particularly crucial roles:

12

- **Presenilin-1 (PSEN-1)** – Located on chromosome 14
- **Presenilin-2 (PSEN-2)** – Located on chromosome 1
- **Amyloid Precursor Protein (APP)** – Located on chromosome 21
- **Apolipoprotein E (APOE)** – Located on chromosome 19
- **Microtubule-Associated Protein Tau (MAPT)** – Located on chromosome 17

Prof. Dey explained that mutations in **APP**, **PSEN-1**, and **PSEN-2** lead to **familial (early-onset)** Alzheimer's disease, typically inherited in an **autosomal dominant pattern**. Conversely, variations in the **APOE** gene, especially the **ε4 allele**, are strongly associated with **late-onset** or **sporadic** forms of AD.

He highlighted that individuals carrying the **APOE ε4 allele** have a significantly higher risk of developing the disease, particularly when combined with other environmental and metabolic factors.

7. Mechanisms of Genetic Influence

Prof. Dey elaborated on two major mechanisms of AD origin:

1. **Familial Alzheimer's Disease (Early Onset)** – Inherited mutations in **APP (Chr. 21)**, **PSEN-1 (Chr. 14)**, **PSEN-2 (Chr. 1)**, **APOE (Chr. 19)**, and **MAPT (Chr. 17)** contribute to aggressive early disease manifestation.
2. **Sporadic Alzheimer's Disease (Late Onset)** – Occurs typically after 65 years, influenced largely by **APOE ε4** and complex gene-environment interactions.

He emphasized that the **ε4 allele of APOE** increases amyloid deposition in the brain, disrupts lipid metabolism, and impairs neuronal repair mechanisms—factors that collectively hasten disease onset.

8. Pathological Alterations in the Brain

Using visual slides, Prof. Dey demonstrated comparative images of a **normal aged brain** and an **Alzheimer's brain**, highlighting the significant shrinkage and neuronal loss characteristic of the latter. He discussed key pathological hallmarks:

- **Amyloid plaques**
- **Neurofibrillary tangles**
- **Neuron and synapse loss**
- **Neuronal cell death**

He illustrated the process of amyloid plaque formation, where enzymes act on the **APP** gene product to produce beta-amyloid fragments that aggregate extracellularly. Simultaneously, abnormalities in **tau protein** led to microtubule disintegration, further impairing neuronal stability.

14

9. Genetic Studies in West Bengal Population

Prof. Dey shared findings from a **case-control study** conducted in West Bengal involving **105 AD patients** and **110 controls**. The study revealed a **significant association of the APOE ε4 allele** with Alzheimer's disease in the local cohort, mirroring global research trends. This discovery, he emphasized, reinforces the genetic consistency of AD risk across diverse populations.

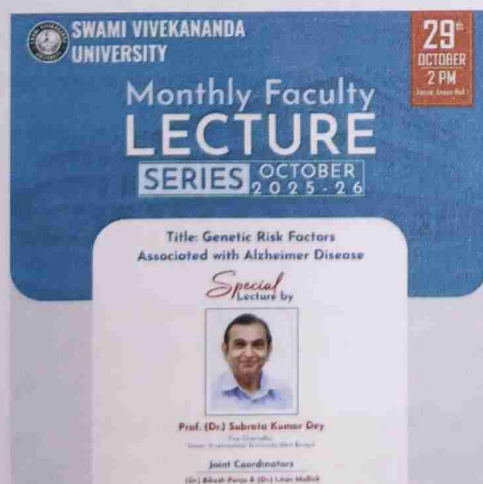
10. Alzheimer's Disease and Down Syndrome

A particularly fascinating aspect of the lecture was the **link between Down syndrome (DS)** and Alzheimer's disease. Prof. Dey explained that individuals with Down syndrome, who possess **three copies of chromosome 21 (trisomy 21)**, also carry **an extra copy of the APP gene** located on that chromosome. This genetic anomaly results in **excess amyloid production**, leading to early and accelerated development of Alzheimer's-like pathology. Consequently, most individuals with Down syndrome exhibit Alzheimer's symptoms by middle age.

Discussion and Q&A Session

The lecture was followed by an engaging Q&A session where participants raised concerns regarding the gene-environment interactions, the reliability of genetic screening, and emerging therapeutic approaches targeting amyloid and tau pathways. Prof. Dey addressed each query with clarity, stressing that while genetic predisposition is significant, lifestyle interventions such as physical activity, cognitive engagement, and dietary regulation can help delay disease onset. He also discussed the potential of gene-editing technologies like CRISPR and molecular chaperone therapies as future directions in combating AD.

Glimpses for Lecture Session:





Concluding Remarks

The event concluded with a heartfelt vote of thanks by Prof. **Anuradha Mukhopadhyay**, **Director, School of Science, SVU**, who expressed profound appreciation to Prof. Dey for his enlightening lecture. He lauded the speaker's ability to bridge molecular genetics with clinical relevance, inspiring researchers to explore interdisciplinary approaches in neurobiology.

Impact and Takeaways

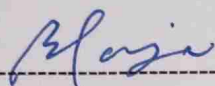
The lecture was an **eye-opening experience** for the attendees, particularly for young scholars and medical researchers. Key takeaways included:

- A deeper understanding of the **genetic architecture** underlying Alzheimer's disease.
- Recognition of **specific gene mutations** (APP, PSEN-1, PSEN-2, APOE, MAPT) as major determinants of disease susceptibility.
- Awareness of **population-based genetic studies**, such as those in West Bengal, that strengthen global genomic data.

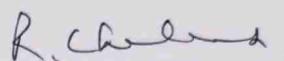
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- The realization that **early genetic screening and counseling** could play a pivotal role in preventive healthcare.
- Insight into the **interconnection between Down syndrome and Alzheimer's**, opening new avenues for research on shared genetic pathways.

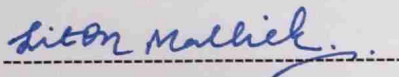
The session reaffirmed SVU's commitment to fostering **interdisciplinary biomedical research** and encouraging genetic literacy among scholars. Participants expressed enthusiasm for future seminars on neurogenetics and molecular diagnostics.



Dr. Bikash Panja
Joint Co-ordinator
Monthly Faculty Lecture Series, SVU



Prof. (Dr.) Ranjan Chakrabarti,
Director, Research & Academic
Development, SVU



Dr. Liton Mallick
Joint Co-ordinator
Monthly Faculty Lecture Series, SVU



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Date: 28th October, 2025

To

Prof. Subrata Kumar Dey

Vice-Chancellor

Swami Vivekananda University

West Bengal -700121

Subject: SVU Faculty Lecture Series October 2025, Invitation regarding

Dear Professor Subrata Kumar Dey,

Greetings from SVU!

At the outset, we would like to acknowledge your significant contributions in the field of research and academic administration.

Swami Vivekananda University, Barrackpore, West Bengal, organizes a Faculty Lecture every month under its Monthly Faculty Lecture Series. It is with great pleasure that I invite you, on behalf of the University, to deliver the Distinguished Faculty Lecture on " **Genetic Risk Factors Associated with Alzheimer Disease** " on **October 29, 2025 at 2 pm** in our campus.

Your expertise and insights will be invaluable in enriching the program, and your lecture will be a source of inspiration for our faculty members and research scholars.

We would greatly appreciate a line of confirmation at your earliest convenience.

For any further information or clarification, please feel free to contact me or Dr. Liton Mallik at Mobile No. 7003185671.

With best regards,

R. Chakrabarti

Professor Ranjan Chakrabarti,

Director Research and Academic Development, Swami Vivekananda University

Hony. Visiting Professor, Jadavpur University

Former Vice Chancellor of Vidyasagar University and Netaji Subhas Open University (WB)

Campus : Telinipara, Barasat - Barrackpore Rd. Bara Kanthalia, West Bengal - 700121.

Corporate Office : Sonarpur Station Rd. Karbala More, Kumarkhali, Narendrapur, Kolkata, West Bengal 700103

Regd. Office : 11/3, Biresw Guha Street, 7th floor, Kolkata : 700017

E- mail : info@swamivivekanandauniversity.ac.in , Contact : 033 2428 3035

Received
[Signature]



Bikash Panja <bikashp@svu.ac.in>

Faculty Lecture - 13, invitation

3 messages

Director, Research & Development <director.research@svu.ac.in>

Tue, Oct 28, 2025 at 8:54 AM

To: Director School Of Management <director.som@svu.ac.in>, director.sos@svu.ac.in, "Director, Research & Development" <director.research@svu.ac.in>, Director School of Life Sciences <dir.solc@svu.ac.in>, director.agriculture@svu.ac.in, Shorosimohan Dan <dan.shorosimohan@gmail.com>, Mita Banerjee <mitabanerjee@hotmail.com>, anuradha_mukhopadhyay@yahoo.com, debnarayanb@svu.ac.in, Subrata Dey <vc@swamivivekanandauniversity.ac.in>, Office Of the Vice Chancellor <office.vc@svu.ac.in>, Swami Vivekananda University - Info <info@swamivivekanandauniversity.ac.in>
Cc: Pinak Pani Nath <registrar@swamivivekanandauniversity.ac.in>, Tanmoy Mazumder <deputy.registrar@svu.ac.in>, abhishek.dhar@svu.ac.in, Sourav Saha <sourav@svu.ac.in>
Bcc: bikashp@svu.ac.in

Dear Esteemed Vice-Chancellor, Chief Operating Officer, Directors, Hods and colleagues

Greetings !

Swami Vivekananda University, Barrackpore, West Bengal, regularly organizes a monthly Faculty Lecture Series and it is delivered by a distinguish scholar from within SVU or outside.

In this context, I am pleased to invite you to kindly make it convenient to attend the upcoming Faculty Lecture of the University on 29 October 2025, to be delivered by Professor (Dr) Subrata Kumar Dey, Vice-Chancellor of Swami Vivekananda University , **at 2.00 pm. The title of his Lecture is 'Genetic Risk Factors Associated with Alzheimer Disease'. Please find the poster of this event attached herewith for your kind perusal.**

Your graceful presence along with your departmental colleagues shall enrich the program and inspire our faculty and research scholars.

Please make it convenient to attend.

Warm regards

Sincerely

Professor Ranjan Chakrabarti,
Director Research and Academic Development, Swami Vivekananda University
Hony. Visiting Professor, Jadavpur University
Former Vice Chancellor of Vidyasagar University and Netaji Subhas Open University (WB)

Fulbright Scholar, Brown University 1994-95
Charles Wallace Fellow, London University 1997
Alexander O'Viator Memorial Fellow, Brown University 2004



**SWAMI VIVEKANANDA
UNIVERSITY**

**29th
OCTOBER
2 PM**
Venue: Annex-Hall I

Monthly Faculty LECTURE SERIES OCTOBER 2025 - 26

**Title: Genetic Risk Factors
Associated with Alzheimer Disease**

Special
Lecture by



Prof. (Dr.) Subrata Kumar Dey

Vice-Chancellor
Swami Vivekananda University, West Bengal

Joint Coordinators

(Dr.) Bikash Panja & (Dr.) Liton Mallick

Director, Research & Development <director.research@svu.ac.in>
To: Bikash Panja <bikashp@svu.ac.in>

Tue, Oct 28, 2025 at 8:55 AM

Dear Professor Panja

Kindly circulate it among all hods.

Regards

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Bikash Panja <bikashp@svu.ac.in>

To: sushmitag@svu.ac.in, Ranjan Kumar <ranjank@svu.ac.in>, "Dr. Sudip Das" <sudipdas1380@gmail.com>, digantab@svu.ac.in, ranjankm@svu.ac.in, subhabrata@svu.ac.in, tanmoys@svu.ac.in, prithap@svu.ac.in, souravm@svu.ac.in, dipanwitag@svu.ac.in,

Tue, Oct 28, 2025 at 10:51 AM

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Cc: director.research@svu.ac.in, deputy.registrar@svu.ac.in, abhishek.dhar@svu.ac.in, sourav@svu.ac.in, litonm@svu.ac.in

Dear all HODs and Research Coordinators

Please find the invitation to the upcoming said program and circulate among our faculty members, research scholars and students. We encourage your participation and look forward to your valuable presence.

----- Forwarded message -----

From: **Director, Research & Development** <director.research@svu.ac.in>

Date: Tue, Oct 28, 2025 at 8:54 AM

Subject: Faculty Lecture - 13, invitation

To: Director School Of Management <director.som@svu.ac.in>, <director.sos@svu.ac.in>, Director, Research & Development <director.research@svu.ac.in>, Director School of Life Sciences <dir.solc@svu.ac.in>, <director.agriculture@svu.ac.in>, Shorosimohan Dan <dan.shorosimohan@gmail.com>, Mita Banerjee <mitabanerjee@hotmail.com>, <anuradha_mukhopadhyay@yahoo.com>, <debnarayanb@svu.ac.in>, Subrata Dey <vc@swamivivekanandauniversity.ac.in>, Office Of the Vice Chancellor <office.vc@svu.ac.in>, Swami Vivekananda University - Info <info@swamivivekanandauniversity.ac.in>

Cc: Pinak Pani Nath <registrar@swamivivekanandauniversity.ac.in>, Tanmoy Mazumder <deputy.registrar@svu.ac.in>, <abhishek.dhar@svu.ac.in>, Sourav Saha <sourav@svu.ac.in>

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Thanks & Regards.

Dr. Bikash Panja

Professor, Department of Mechanical Engineering
Dean, Faculty Council of Engineering and Technology
School of Engineering, Swami Vivekananda University
Kolkata - 700121, India

Mobile: (+91) 9635973141

Monthly Faculty Lecture Series

Swami Vivekananda University



Barrackpore - Barasat Rd, Sewli Telinipara, Malir Math,

Bara Kanthalia, West Bengal 700121

October - 2025

29/10/2025

SL No.	Name	Department	signature
1)	Dr Keya Ghosh	IIC.	Ghosh
2)	Dr. Sibashish Balesi	Biotechnology	Balesi
3)	RAIJAN CHAKRABARTI	RES. & ALA. DEV	R. Chak
4)	Anuradha Mukhopadhyay	School of Science	Anuradha
5)	Dr. Pritha Pal	Microbiology	Pal
6)	Dr. Palash Kumar Pal	Biotechnology	Pal
7)	Dr. Subhasis Sarkar.	Microbiology	Sarkar.
8)	Dr. Suprabuddha Kundu	Agriculture	Kundu
9)	Dr. Sayani Bhattacharya	Agriculture.	Sayani
10)	Dr. Animesh Ghosh	Agriculture	Ghosh
11)	Dr. Sudip Sengupta	Agriculture	Sengupta
12)	Arinmoy Palit	Agriculture	Palit
13)	Arindam Chatterjee	English	Chatterjee
14)	Debarshi Aratindan	English	Aratindan
15)	Rajen Dey.	MLT	Dey
16)	Monojit Bysack.	MLT.	Bysack.

Monthly Faculty Lecture Series

Swami Vivekananda University



Barrackpore - Barasat Rd, Sewli Telinipara, Malir Math,

Bara Kanthalia, West Bengal 700121

October - 2025

29/10/2025

SL No.	Name	Department	signature
1	Prof. Dr. Mitā Banerjee	Chief Academic Advisor Education Dept.	MBanerjee 29.10.25
2	Malayendu Saha	Director, School of Management	M Saha 29.10.25
3	Arnab Das	CSE dept.	Arnab Das 29/10/25
4.	Dr KUMAR RAVIRANJAN	CSE	Kr. Ravirajan
5	Dr. Sibashish Baksi	Biotechnology	Baksi
6.	Dr. Semanti Ghosh	Biotechnology	Sghosh
7.	Suranjana Sarker	Microbiology	Ss
8.	Dr Bidisha Ghosh	Biotechnology	Bidisha Ghosh
9.	Dr. Priyankaar Pan	Biotechnology	Priyankaar
10	Souvan Girci	ME	Girci
11	Anupam Mallik	ME	anupam
12	Arnab Das	ME	Arnab
13	Dr. Md Ershad	ME	Md Ershad
14.	Dr. Oly Banerjee	HLT.	Oly Banerjee
15	Arnab Sarma	MRIT	Arnab Sarma
16.	SUBHRANIL MUKHERJEE	MRIT.	Subhranil

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