



**Successful R & I in Europe 2024**  
**11th European Networking Event**  
**15-16 February, 2024**  
**Düsseldorf (GERMANY)**



## **DESIGNING SMART PEPTIDES:**

# **A NEW FRONTIER IN COMBATING MILD COGNITIVE IMPAIRMENT**

Ștefan Eugen Szedlacsek  
Institute of Biochemistry of the Romanian Academy  
Bucharest (ROMANIA)

## my scientific background

- **PhD** in Biotechnology
- **MSc** in Organic Chemistry/ **MSc** in Mathematics
- **Publications in Web of Science:** 54
- **Awards/Scholarship:** Alexander von Humboldt (GERMANY)  
Fulbright Visiting Scholar (USA)  
EMBO (European Molecular Biology Organization)
- **Professor of Biochemistry**
- **Head,** Department of Enzymology - Institute of Biochemistry, Bucharest (ROMANIA)

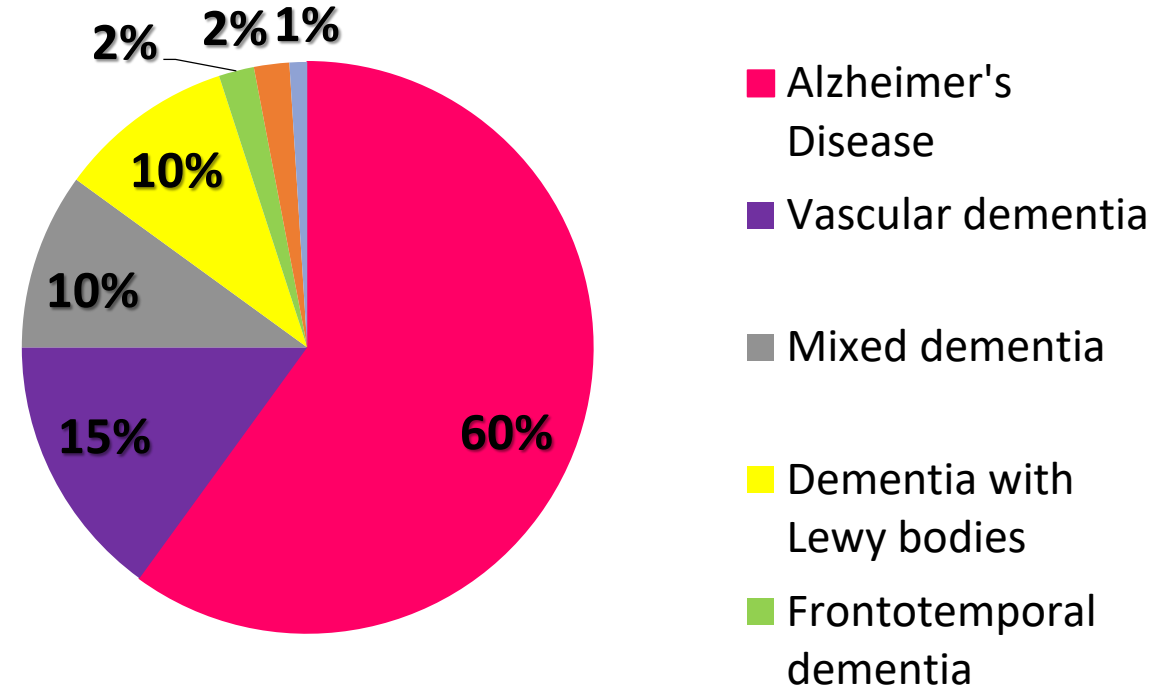
## my experience in national/international/EU R&D&I projects

- **Coordinator of 21 national grants**
- **Coordinator of 1 international consortium**
- **Coordinator of 1 NATO Linkage grant**
- **Romanian Head of Project - Deutsche Forschungsgemeinschaft (DFG)**
- **Partner leader in EU Project consortium:** "*Protein Tyrosine Phosphatases: Structure, regulation and biological function 2007 - 2011*"

# Mild Cognitive Impairment (MCI): The Critical Window for Combating Future Dementia

- **Dementia worldwide:** 55 milion people
- **MCI patients annually converted to AD: 15%**
- **15.6% MCI prevalence in people >50:** 15.6%
- **Global prevalence of MCI:** 19.7%.
  
- **Dementia in EU:** 7.85 million people in 2019  
the number will double in 2050
- **Dementia prevalence in EU:** 45% in those aged  $\geq 95$

Breakdown of Dementia by disease type



# Our Research: Pioneering Peptides for Cognitive Enhancement

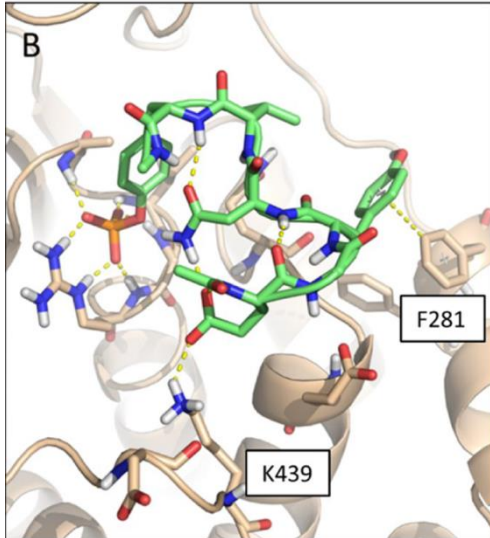
Using structure-based modeling and biochemical tools



we found several short peptides with proven efficacy



which improve cognition and has anxiolytic effects in rats



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(12) **United States Patent** (10) **Patent No.:** **US 11,834,518 B2**  
**Szedlaczek et al.** (45) **Date of Patent:** **Dec. 5, 2023**

(54) **INTERFERENCE PEPTIDES AS INHIBITORS OF INTERACTIONS RELATED TO AMPAR ENDOCYTOSIS** (56) **References Cited**

(71) Applicants: **Stefan Eugen Szedlaczek**, Bucharest (RO); **Rodica-Aura Badea**, Bucharest (RO); **Horea-Stefan Szedlaczek**, Bucharest (RO)

(72) Inventors: **Stefan Eugen Szedlaczek**, Bucharest (RO); **Rodica-Aura Badea**, Bucharest (RO); **Horea-Stefan Szedlaczek**, Bucharest (RO); **Lucian Hritcu**, judetul Iasi (RO)

(73) Assignees: **Stefan Eugen Szedlaczek**, Bucharest (RO); **Rodica-Aura Badea**, Bucharest (RO); **Horea-Stefan Szedlaczek**, Bucharest (RO)

(\*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

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 (22) Filed: **Jan. 5, 2023**  
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**Related U.S. Application Data**  
 (63) Continuation of application No. PCT/IB2021/057960, filed on Aug. 31, 2021.  
**Foreign Application Priority Data**  
 Aug. 31, 2020 (RO) ..... a 2020 00548

(51) **Int. Cl.**  
**C07K 7/06** (2006.01)  
**A61K 38/00** (2006.01)  
 (52) **U.S. Cl.**  
**CPC** ..... **C07K 7/06** (2013.01); **A61K 38/00** (2013.01)  
 (58) **Field of Classification Search**  
**CPC** ..... **C07K 7/06**, **A61K 38/00**  
 See application file for complete search history.

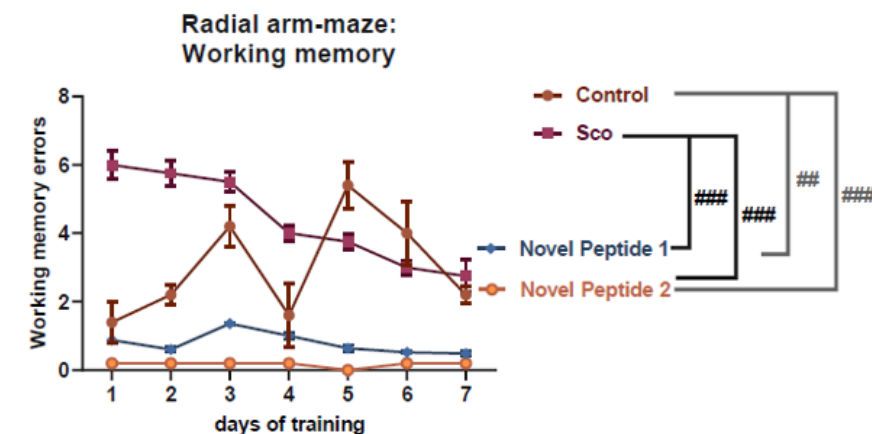
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 International Search Report and Written Opinion of International Searching Authority for International Patent Application No. PCT/IB2021/057960, dated Dec. 14, 2021 (11 pages).

\* cited by examiner  
 Primary Examiner — Amber D Steele  
 (74) Attorney, Agent, or Firm — NIXON PEABODY LLP

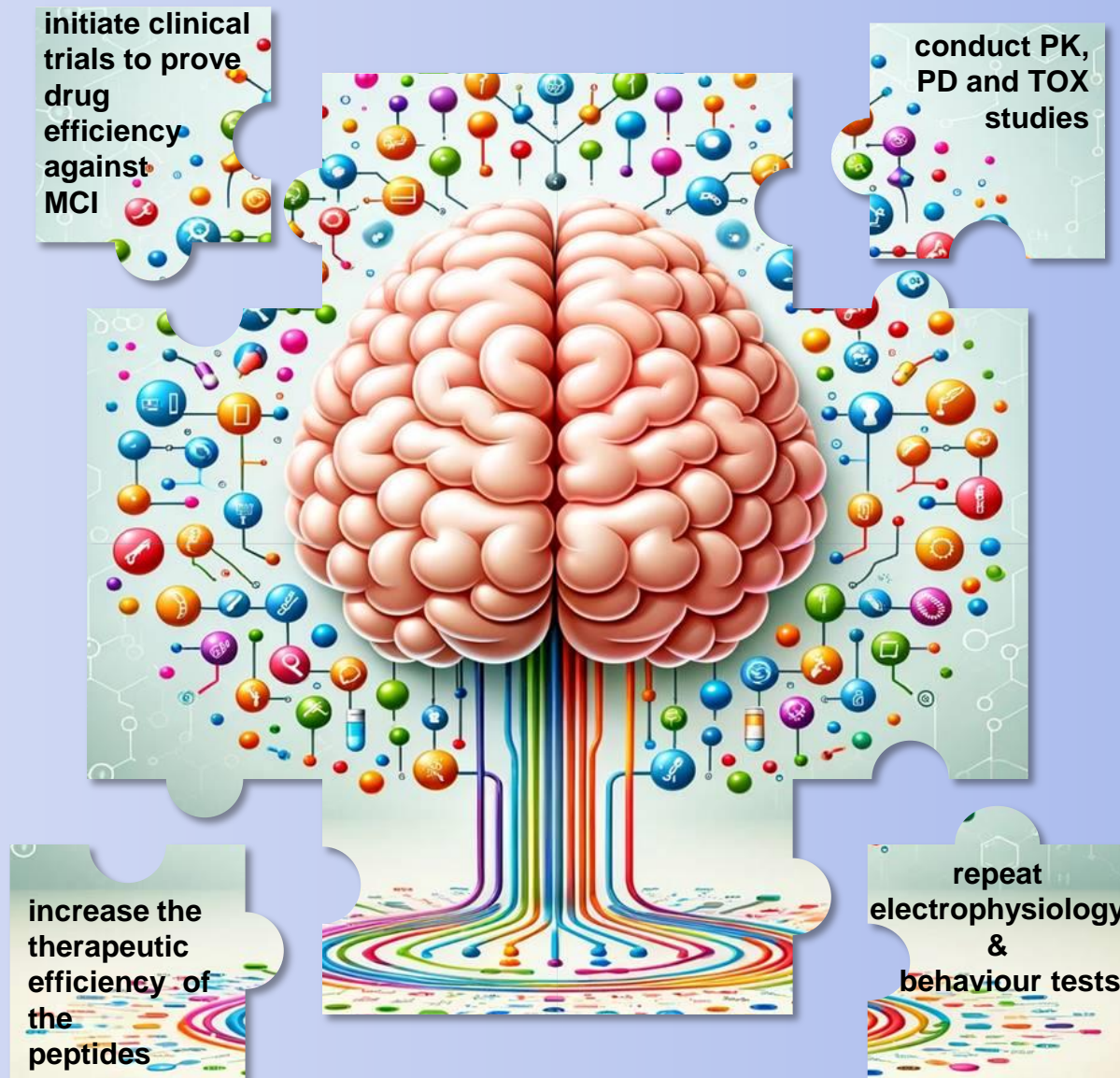
(57) **ABSTRACT**  
 The invention relates to interference peptides as inhibitors of the interactions related to AMPA receptor endocytosis, to peptide compounds comprising said peptides that can be used in medicine, in the field of neurology and psychiatry, in particular for the prevention and therapy of mild cognitive impairment in neurodegenerative diseases or in the prophylaxis of depression and anxiety, as well as to peptidomimetic compounds of interference peptides with a blocking effect on the interaction between AMPA receptor and STEP phosphatase and to a method of inhibiting AMPA receptor endocytosis in neurons, especially in synaptic neurons.

**3 Claims, 25 Drawing Sheets**  
**Specification includes a Sequence Listing.**



Behaviour experiments with rats. The two curves at the bottom of the graph correspond to the administration of our novel peptides

# Strategic Pathways: Enhancing Peptide Therapeutics within Horizon Europe Partnerships





# Collaboration and Support: Join Our Mission

## **We are seeking:**

**A. Research Teams:** Calling academic and corporate research teams for joint funding applications, especially for Horizon Europe.

**Valued expertise:** neuropharmacology, animal behavior, molecular modeling

**B. Companies:** Seeking SMEs, companies to test novel cognition enhancers for preclinical and clinical trials.

**Required expertise:** in pre-clinical trial management

**C. Investors:** Inviting investors to support preclinical & clinical trials, crucial for developing our peptides into groundbreaking cognition enhancers

**Contact:** Stefan Eugen Szedlacsek - [szedlacs@yahoo.co.uk](mailto:szedlacs@yahoo.co.uk)