

PN-II-ID-PCE-2011-3-0856

Project title: **IMMUNOMODULANTE FLUOROGLYCOPEPTIDE MOLECULAR ARCHITECTURES**

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Summary:

The project follows fundamental research activities that begin with the elucidation and evaluation structure of new natural glycopeptides products, the focus will be on medicinal plants of the Carpathian Mountains, the extracts of which have already shown biological activities. In the area of marine natural products research, compounds from marine invertebrates found in the Black Sea will be explored. In particular the total synthesis and functionalization of glycopeptides systems will be addressed. A key issue in natural products research concerns the total synthesis of new immunomodulating fluoroglycopeptides molecular architectures from natural products. Here, we will develop new methodology enabling the functionalization of natural products for photolabelling studies. By complex techniques and methodologies we will investigate the partial and final structures of synthesized chromophore systems. The design of compact tags unifying fluorescent and photoreactive properties will be a topic of basic chemical research as integral part of this project.

Project Scientific Objectives:

O.1	The identification of new natural glycopeptides with biological activity and selective human organ carrier properties from natural extracts isolated from Carpathian flora and fauna of the Black Sea – through advanced basic research to elucidate and evaluate these new bioactive structures as precursors for new drugs.
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O.2	Structural modification of natural glycopeptide systems selected from of natural products by functionalization, and photolabelling of natural structure and chemical synthesis of peptidomimetic analogues bioreactive with enhanced properties.
O.3	Synthesis and characterization of new immunomodulating fluoroglycopeptides molecular architectures using the photoreactive Ddz amino protected group Ddz by innovative stereoselective total synthesis and biosynthesis methods of peptide selected from the natural selected structures.
O.4	Study on molecular recognition processes on peptide–peptide and peptide–glycopeptide interactions using amino acids or peptides as fluorescent linker, and characterization of chromophore systems obtained.
O.5	Testing the biological activity of new immunomodulating fluoroglycopeptides molecular architectures synthesized by computational chemistry and electrochemistry techniques.
O.6	Dissemination of project results through web portal project, and participation to international scientific and technical events in specific project areas, and communicate scientific papers published in journals with internationally high visibility, patent applications.

Project team:

Dr. Ion NEDA, 64 years, organic chemist – Project Director

Dr. Ioan GROZESCU, 60 years – member

Dr. Adina–Elena SEGNEANU, 40 years – member

Dr. Paulina VLAZAN, 54 years– member

Dr. Raluca Oana POP, 32 years– member

Dr. Paula SFIRLOAGA, 37 years – member

Dr. Anamaria DABICI, 28 years– member

Drd. Cristina MOSOARCA– member

Dr. Roxana BIRZOI, 33 years– member

Dr. Carmen LAZAU, 46 years– member

Dr. Corina ORHA, 35 years– member

Drd. Daniel URSU, 28 years– member

Dr. Cornelia BANDAS, 32 years– member

Valeria Nadina VLATANESCU, 30 years– member

Dr. Ionel BALCU, 44 years– member

Fedor Elena, 33 years– member

Maftai Catalin Vasile, 33 years– member

Macarie Amalia Corina, 34 years– member

Martin Heiko Franz, 44 years– member

PROJECT BUDGET: 1,700,000 lei

PROJECT DURATION: Oct. 2011 – Oct. 2015

Disemination:

Peptide and Amino Acids Separation and Identification from Natural Products by I. Neda, P. Vlazan, R.O. Pop, P.Sfarloaga, I. Grozescu, A.E. Segneanu, in the book – **Analytical Chemistry**, Ed. by [Ira S. Krull](#), ISBN 978–953–51–0837–5, Publisher: InTech, November 07, 2012, p.135–146.

Synthesis and characterization of novel bioactive 1,2,4–oxadiazole natural product analogs bearing the N–phenylmaleimide and N–phenylsuccinimide moieties by C. V. Maftai, E. Fodor, P. G. Jones, M. H. Franz, G. Kelter, H. Fiebig and I. Neda, *Beilstein J. Org. Chem.* 2013, 9, 2202–2215

New Members of the Cinchona Alkaloid Family: 9–Aminoquinoline–10–aldehyde and 9–Aminoquinoline–10–aldehyde by I. Neda, E. Fodor, C. V. Maftai, M. Mihorianu, H. D. Ambrosi and M. H. Franz, *Eur. J. Org. Chem.* 2013, 35, 7876.

The Influence of Extraction Process Parameters of Some Biomaterials Precursors from Helianthus annuus by A. Segneanu, I. Grozescu, P. Sfarloaga, *Digest Journal of Nanomaterials and Biostructures* Vol. 8 (4), p. 1423– 1433 (2013)

National and International Conferences

1. A. E. Segneanu, I. Grozescu, C. Lazau, C. Badas, A. Dabici, N. Vlatanescu, I. Neda, *Characterization of some important natural compounds from Cheledonium major*,

International Conference Chimia 2012 "New Trends in Applied Chemistry", May 24 – 26, 2012, Constanta, Romania, PA1.

2. Grozescu, A. E. Segneanu, C. Lazau, C. Bandas, A. Dabici, N. Vlatanescu, I. Neda, *Isolation and analysis of some important natural compounds from Anchusa officinalis* International Conference Chimia 2012 "New Trends in Applied Chemistry", May 24 – 26, 2012, Constanta, Romania, PA10. I.
3. Segneanu A.E., Grozescu Ioan, Sfirloaga Paula, Pop Raluca, Neda Ion, *Studies On Peptides and Glycopeptides from Viscum Sp.*, 13th Congress of the International Society for Ethnopharmacology, Graz, Austria, September 2 – 6, 2012, P426.
4. I. Grozescu, A.E. Segneanu, P. Sfirloaga, A. Dabici, I. Neda, *Physico-Chemical Characterization of Biological Active Compounds from Helianthus Annuus*, 6th International Conference on Materials Science and Condensed Matter Physics (MSCMP 2012), Chisinau, Moldova, CPPP 39 P;
5. A.E. Segneanu, I.Grozescu, P.Sfirloaga, R.Pop, I.Neda, *Studies on Chemical Composition of Helleborus puspurascens*, XXXII-nd Romanian Chemistry Conference, Oct. 2012, Calimanesti-Caciulata, Valcea, Romania, P.S.I.22;
6. A.E. Segneanu, I. Grozescu, P. Sfirloaga, R. Pop, P. Vlazan, I. Neda, *Studies on Peptides and Free Amino Acids from Eupatoria cannabinum*, Simpozionul internațional „Prioritățile Chimiei Pentru o Dezvoltare Durabilă Priochem ” ediția a VIII-a, 25 – 26 octombrie 2012, București, Romania
7. A.-E. SEGNEANU, P. SVERA, M. CHIRITA, L. KOSS, P. Sfirloaga, I. GROZESCU, *Synthesis of a Natural Cyclic Peptide from Hellebore sp. as Biomaterial Precursors*, 4rd International Conference "Research People and Actual Tasks on Multidisciplinary Sciences", 12- 16 June 2013, Lozenec, Bulgaria.
8. A.-E. SEGNEANU, P. VLAZAN, A. PETRIC, P. Svera, I. Grozescu, *Magnetic Cobalt Ferrite Nanoparticles: Synthesis and Surface Functionalization with Peptide*, BRAMAT 2013, International Conference On Materials Science & Engineering, 28 February – 2 March 2013, Brașov, Romania.

9. P. Sfirloaga, A. Segneanu, P. Vlazan, A. Dabici, I. Neda, I. Grozescu The influence of extraction method on isolation of biological active compounds from sunflower (*Helianthus annuus*), *XVII International Sol-Gel Conference*, August 25–30, 2013 in Madrid, Spain.
10. Ion Neda, Heiko Franz *Small bio-active molecules with potential cytostatic activity* Summer School, July 8–10, 2013, Petru Poni Institute of Macromolecular Chemistry, Iasi, Romania
11. Claudia Lar, Anamaria Terec, Ion Neda, Ion Grosu *Synthesis and Structural Analysis of Some New Hexahomotrioxacalix[3]arene Derivatives Based on Terpyridine Units* Frühjahrssymposium 2013, in Berlin, Jung Chemiker Forum, Berlin, 06.03. 2013
12. Segneanu, P. Svera, I. Grozescu *Peptide with Potential Biological Activity* Simpozionul International PRIOCHEM, editia a IX-a, 24–25 octombrie 2013

Conferinte Plenare 2014

Universitatea Politehnica Timișoara și Societatea de Chimie din România, Filiala Timișoara, a organizat o conferință pe teme actuale din domeniul chimiei susținută de Prof.dr. Ion NEDA de la Universitatea Tehnică din Braunschweig, Germania.

Manifestarea a avut loc miercuri, 29 ianuarie 2014, ora 11:00, în Sala Senatului Universității Politehnica Timișoara.

Synthesis of asymmetric Calixarene-derivatives as potential hosts in chiral recognition processes, 15th International Conference "Polymers and Organic Chemistry", June 10–13, Timisoara, Romania Heiko Franz, Corneliu-Mircea Davidescu, Ion Neda,

Postere 2014

1. C. V. Maftei, E. Fodor, I. Neda *Synthesis of Novel Photoreactive Peptides derivatives of 6-Methoxy Quinolinic Acid and Quinine*, Tagung, GDCH, Braunschweig, 06.05–08.05. 2014
2. E. Fodor, C.V. Maftei, I. Neda *Synthesis of Novel Asymmetrically Homotriazacalix[3]arene Derivatives and Their Extraction Behavior for Natural Productes*, Tagung, GDCH, Braunschweig, 06.05–08.05. 2014

3. C. V. Maftai, E. Fodor, I. Neda *Novel Silver and Gold N-Heterocyclic Carbene Initiators in the Ring-Opening Polymerization of L-Lactide*, 15th International Conference "Polymers and Organic Chemistry", June 10–13, Timisoara, Romania

4. E. Fodor, Catalin Maftai, Ion Neda *Gold (I) Alkynyl Complexes Derivatives of Cinchona Alkaloids. Synthesis and Antitumor Activity*, 15th International Conference "Polymers and Organic Chemistry", June 10–13, Timisoara, Romania

5. Birzoi R. Kelter G. Fiebig H. Neda I. *BIFUNCTIONAL DERIVATIVES OF THE ISOPHOSPHORAMIDE MUSTARD*, 20th International Conference on Organic Synthesis, 29 June–4 July 2014 – Budapest, Hungary

6. Monica Mihorianu, Ion Neda, *Synthesis, Design and Characterization of Gold (I) and Silver (I) NHC-complexes based on imidazo[1,5-a]pyridine moiety for applications in the biomedical field*, Chirality, 27–30 July, Prague, Czech Republic