

Centru de cercetare

Denumire:

Centrul de chimia heterociclorilor aplicate in nanostiinte, medicina si mediu

Acronim: HETNANMED

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Resursa umana

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3. Conf. dr. Vasile Tura
4. Conf. dr. Ramona Danac
5. Conf. dr. Costel Moldoveanu
6. Conf. dr. Gheorghita Zbancioc
7. Lect . dr. Robert Gradinaru
8. CS III Dr. Vasilichia Bejan
9. As. Dr. Dorina Mantu
10. As. Drd. Drd. Dan Maftei
11. ACS dr. Catalina Ciobanu
12. CS dr. Alina Brindusa Petre
13. Doctoranzi, masteranzi, studenti licenta

Directorul centrului, este raspunzator de *coordonarea stiintifica si manageriala* a centrului. Directorul va actiona ca interfata intre membri, asigurind astfel comunicarea atat pe orizontala cit si pe verticala.

In activitatea de coordonare directorul de proiect este ajutat de un **comitet permanent** format din profesorii si conferentiarilor din echipa.

Ca si atributii specifice, **directorul si membrii comitetului permanent**, se vor ocupa de problemele conceptuale, formularea si verificarea de ipoteze, elaborarea si experimentarea de modele/metode/teorii, activitati suport, activitati de coordonare si control. **Cercetatorii cu experienta** (doctorii) se vor ocupa atat de realizarea experimentală a proiectului, si vor contribui partial la activitatile prezentate la punctul anterior. **Cercetatorii in formare** (doctoranzii si masteranzii) vor contribui la realizarea experimentală a proiectului si la activitati suport.

Domenii de cercetare

Centrul de cercetare in domeniul chimiei heterociclicilor aplicate in nanostiinte, va functiona ca un centru integrat multidisciplinar cu urmatoarele subdomenii de expertiza:

- 1. Chimia si sanatatea: chimia heterociclicilor cu azot si chimie medicinala;**
- 2. Chimia si nanostiintele: macrocicli cu azot si oxigen, device-uri moleculare, chimie supramoleculara;**
- 3. Chimia si mediul: reactii ecologic prietenoase sub actiunea microundelor si ultrasunetelor.**

In cadrul acestor subdomenii sunt vizate urmatoarele aspecte:

1. Chimia si sanatatea: cercetarile intreprinse vizeaza deschiderea unor directii noi de cercetare in chimia heterociclicilor cu azot si a azot-ilidelor. Principalele rezultate asteptate pot fi rezumate astfel: sinteza de compusi tinta biologic activi [potientiale medicamente (antineoplazice, anti-HIV, antituberculoase, antimicrobiene) si factori de crestere in agricultura], noi nanomateriale si nanobiomateriale cu schelet heterociclic, oligo- si polipeptide (inclusiv pentru tratarea maladiei Alzheimer), etc.;

2. Chimia si nanostiintele: in acest subdomeniu cercetarile noastre sunt orientate spre sinteza de azacriptanzi si coronanzi, noi materiale cu fluorescanta inalta, device-uri moleculare (cu precadere „logic gates”), chemosenzori;

3. Chimia si mediul: sunt vizate reactiile sub actiunea microundelor si ultrasunetelor, care se incadreaza in categoria asa ziselor reactii „ecologic prietenoase”, care reduc poluarea mediului. Relativ la aceste ultime aspecte, de depoluare a mediului, se incadreaza si preocuparile noastre in domeniul chimiei chemosenzorilor.

Cuvinte cheie: heterocicli, diazine, ilide, coronanzi, azacriptanzi, microunde, ultrasunete, cicloaditii, anticancer, antituberculoase, antimicrobiene, factori de crestere, nanobiomateriale, materiale fluorescente, semiconductori, cristale lichide, device-uri moleculare, chemosenzori, chimie “ecologic prietenoasa”.

Infrastructura

Grupul dispune de:

- 4 laboratoare de cercetare dotate corespunzator pentru *Sinteza Organica Fina, Sinteza Macroiciclicilor si Heterociclicilor cu Azot si alti Heteroatomi*. Laboratoarele sunt prevazute cu toata “mica” aparatura, necesara : agitatoare, etuve, butelii gaz inert, rotavapoare, pompe vid, balante tehnice si analitice etc., inclusiv infrastructura adiacenta fiecarui laborator (nise, console etc.);
- 2 laboratoare dotate corespunzator pentru *Sinteza Toxicologie*. Laboratoarele sunt prevazute cu toata “mica” aparatura, necesara : agitatoare, etuve, butelii gaz inert, rotavapoare, pompe vid, balante tehnice si analitice etc., inclusiv infrastructura adiacenta fiecarui laborator (nise, console etc.);
- 1 laborator pentru *Reactii sub Actiunea Microundelor si a Ultrasunetelor*;
- 1 laborator pentru *Analiza Structurala Organica*;

Listă echipamente majore:

- Spectrometru RMN de 500 MHz, Bruker Biospin;
- Difractometru de raze X- monocristal, Difractometru Super Nova cu doua surse (Cu si Mo);
- Gaz cromatograf cuplat cu spectrometru de masă SHIMADZU QP 2010 (cu EI, CI pozitiv, introducere directa), Shimadzu, Japonia, 2006, valoare 140.000 Eur;

- FTIR 8400s / IR-Prestige – 21 (pentru solide si lichide), Shimadzu, Japonia, 2006, valoare 20.000 Eur;
- UV-VIS V-1800 Shimadzu, Japonia, 2008, valoare de 15.000 Eur
- Reactor de microunde monomod presiune, Monowave 300 (Anton Parr, Austria, anul de fabricație 2012, valoare 30.000 Eur);
- Reactor de microunde monomod, STAR-2 (CEM, SUA, anul de fabricație 1999, valoare 25.000 Eur);
- Generator de ultrasunete Sonix VCX 130 (Sonisc&Materials, USA, 2005, 10.000 Eur);
- Generator de ultrasunete Sonoplus HD 3200 (Bandelin, Germania, 2006, 7.000 Eur);
- Liofilizator ALPHA 1-2 LD Plus (Christ, Germania, 2006, 20.000 Eur);
- Aparat pentru răcire avansata cu recirculare LAUDA VKL 600 (Bandelin, Germania, 2006, 14.000 Eur);

Tehnica de calcul: calculatoare Pentium III si IV (cu softuri certificate), Scanere, Imprimante (cu jet color si laser), xerox, surse stabilizatoare, etc.

Surse de documentare: avem acces nelimitat, prin biblioteca facultatii, la urmatoarele surse de documentare:

- principalele colectii de reviste de specialitate (Springer, American Society, Willey, Elsevir, etc) sunt accesibile atat via internet cit si in biblioteca Facultatii de Chimie;
- abonamente curente la Chemical Abstracts (editie completa);
- surse de informare electronica Scopus, ISI Thomson, acces complet la internet pentru banci de date "free service".

Publicatii

-Ultimmi 5 ani-

Lucrari:

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Brevete:

1. Iurea, D. (RO); Chintea, P. (MD); **Mangalagiu, I.I.** (RO); Munteanu, N. (RO); Istrate, M. (RO); Cotenco, E. (MD); Iurea, R. (RO). Biostimulation procedure of Pepper Crop (Procedeu de tratare a plantelor de ardei gras). Patent MD, No. 342/19.11.2010, AGEPI Chisinau, Rep. Moldova.

Property Rights Owner: Institutul de Genetica si Fiziologia Plantelor al Academiei de Stiinte a Moldovei, Moldova

2. Iurea, D. (RO); Chintea, P. (MD); **Mangalagiu, I.I.** (RO); Munteanu, N. (RO); Chirilov, E. (MD); Cotenco, E. (MD); Iurea, R. (RO). Treatment process of Apple Tree (Procedeu de cultivare a marului). Patent MD, No. 383/19.11.2010, AGEPI Chisinau, Rep. Moldova.

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4. Iurea, D. (RO); **Mangalagiu, I.I.** (RO); Munteanu, N. (RO); Mustea, M. (RO); Chintea, P. (MD); Chirilov, A. (MD); Cotenco, E. (MD); Iurea, P. (RO); Iurea, R. Stimulation procedure of Grapes crop (Procedeu de cultivare a vitei de vie). Patent MD, No. 235/31.07.2010, AGEPI Chisinau, Rep. Moldova.

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5. Hagi, B.; Sandu, I.; Lupascu, T.; Vasilache, V.; Tura, V.; **Mangalagiu, I.I.**; Sandu, A.; Gonciar, V. Procedure for obtaining of an injectable silver oil nanodispersion (Procedeu de obtinere a unor nanodispersii uleioase de argint injectabile). Patent MD, No. 4106/03.12.2010, AGEPI Chisinau, Rep. Moldova.

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6. Hagi, B.; Sandu, I.; Vasilache, V.; Tura, V.; **Mangalagiu, I.I.**; Mungiu, O. C.; Filote, C.; Sandu, A. Proces for preparing an oily nanodispersion with tissue regenerative capacity (Procedeu de obtinere a unor nanodispersii uleioase cu proprietati tisulare regenerative). Patent RO, RO127723-A2, 26.11.2010.

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7. Hagi, B.; Sandu, A.; Lupascu, T.; Chirazi, M.; **Mangalagiu, I.I.**; Sandu, I.; Ciobanu, M.; Vasilache, V. Pouders with homeostatic and regenerative capacity (Pudra avind capacitate homeostatica si regenerativa). Patent MD, No. 4117/30.07.2010, AGEPI Chisinau, Rep. Moldova.

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Carti si capitole de carti

1. A. K. Haghi (Ed.), In: Electrospun Nanofibers and Nanotubes: Research Advances, Chapter 14- Electrospinning of gelatin/chitin composite nanofibers, by: V. Tura, F. Tofoleanu, **I. Mangalagiu**, Mindru, T.; Brinza, F.; Sulitanu, N.; Sandu, I.; Raileanu, D.; Ionescu, C., Nova Science Publishers, New York, US (Series: Nanotechnology Science and Technology) 2009, pp. 239-252. ISBN: 978-1-60741-834-4
Web: https://www.novapublishers.com/catalog/product_info.php?products_id=10299
2. G. Drochioiu, M. Murariu, **I. I. Mangalagiu**: "Plantele medicinale si metalele grele"(143 pag.), Ed. Tehnopress, 2011, Iasi. ISBN: 978-973-873-0
3. **I. I. Mangalagiu**, Ramona Danac; Costel Moldoveanu; Gheorghita Zbancioc, CHIMIE SI TOXICOLOGIE JUDICIARA. SEPARATOLOGOLOGIE JUDICIARA, Editura „AIT –SRL Laboratory”, Bucuresti 2011. (217 pag.) ISBN: 978-606-8363-09-7x2.

Granturi:

1. Grant FP7- People-2009-IRSES-No. 246902

Title: **Photocatalytic Clusters Complexes for Artificial Photosynthesis Applications**

Finance from: **European Union- FP7 program IRSES**

Directors: prof.dr. Ionel Mangalagiu, Romania/ prof. Dr. Andrew Benniston, UK
(coordinator)/ prof.dr. Constantin Turta, Moldova

Duration: 2010-2012, grant no. 246902/2009

Value: Total: 194.400,00 Euro

2. Bilateral Grant Romania-Moldova

Title: **Biologically active compounds with terpenoid and azaheterocycle skeleton through conventional and nonconventional methods**

Finance from: Romanian (ANCS, PN-II program, Modul III) and Moldavian Government

Directors: prof.dr. Ionel Mangalagiu, Romania/ CP I.dr. Aculina Aracu, Academy of Science of Rep. Moldova

Duration: 2010-2012 grant nr. 418/02.06.2010

Value: 41.376 lei (10.000 Euro aprox)

3. Director: Prof. dr. IONEL MANGALAGIU

Type of grant: PN II-Ideas, grant PN-II-DE-PCE-2011-3-0038, No. 268/2011

Finance from: **CNCSIS**, Romanian Ministry of Education and Research

Duration: 2012-2014

Title: **New polifunctional nitrogen derivatives (heterocycles, podants and macrocycles) as smart versatile building blocks for multiple tasks**

Value : **350.000,00 €**

4. Director: Prof. dr. IONEL MANGALAGIU

Type of grant: PN II-Ideas, grant. No. 88/2008

Finance from: **CNCSIS**, Romanian Ministry of Education and Research

Duration: 2009-2011

Title: **Chemosensors with Macrocyclic Skeleton**

1st year: 2009. Value : 25.000,00 €
2nd year: 2010. Value : 35.000,00 €
3rd year: 2011, Value : 45.000,00 €