

Nume Prenume: **ANTOCI VASILICHIA**

Gradul didactic: **Conferențiar universitar doctor**

Instituția unde este titular: **UNIVERSITATEA ALEXANDRU IOAN CUZA DIN IAȘI**

Facultatea: **de CHIMIE**

Departamentul: **CHIMIE ORGANICĂ**

## L I S T A LUCRĂRILOR ȘTIINȚIFICE

### A. Teza de doctorat

*Titlul tezei de doctorat:* "Azaheterocicli analogi steroidelor naturale obținuți prin metode convenționale și neconvenționale", elaborată sub coordonarea Prof. dr. Ionel Mangalagiu la Catedra de Chimie Organică, Facultatea de Chimie, Universitatea "Alexandru Ioan Cuza" din Iași. Iulie 2010: Doctor în Chimie (Ordinul MEC 4542/28.07.2010).

### B. Cărți și capitole în cărți publicate în ultimii 5 ani (2021-2025)

1. Amariuca-Mantu, D.; **Antoci, V.**; Sardaru, M.C.; Al Matarneh, C.M.; Mangalagiu, I.; Danac, R.: **6 Fused pyrrolo-pyridines and pyrrolo-(iso) quinoline as anticancer agents**, book chapter in *Heterocyclic Anticancer Agents*, edited by Bimal Krishna Banik and Bubun Banerjee, Berlin, Boston: De Gruyter, **2022**, pp. 185-248. <https://doi.org/10.1515/9783110735772-006>.

2. Danac, R.; Amariuca-Mantu, D.; **Antoci, V.**; Zbancioc, Ghe.; Mangalagiu, V.; Mangalagiu, I.I.: **Microwave assisted reactions for synthesis of bioactive azaheterocycles**, book chapter in *Current Advances in Chemistry and Biochemistry*, Vol. 3, Book Publisher International, Dr. Pradip K. Bhowmik (Editor), page 17-50, 4 March **2021**. <https://doi.org/10.9734/bpi/cacb/v3/7477D>  
ISBN-13 (15): 978-93-90768-93-6(Print), 978-93-90768-91-2 (eBook)

### C. Lucrări indexate ISI/BDI publicate în ultimii 5 ani (2021-2025)

1. Balaes, T.; Mangalagiu, V.; **Antoci, V.**; Amariuca-Mantu, D.; Diaconu, D.; Mangalagiu, I.I.\*: Hybrid bis-(imidazole/benzimidazole)-pyridine derivatives with antifungal activity of potential interest in medicine and agriculture via improved efficiency methods. *Pharmaceuticals*, **2025**, *18*, 495. MDPI, ST ALBAN-ANLAGE 66, CH-4052 BASEL, SWITZERLAND. ISSN:1999-4923 <https://doi.org/10.3390/ph18040495> (IF 2024=**4.9**)

2. Ciorteanu, R.; Ciobanu, C.-I.; Cibotariu, N.; Shova, S.; **Antoci, V.**; Mangalagiu, I.I.; Danac, R.: Functionalized Indolizines as Potential Anticancer Agents: Synthetic, Biological and In Silico Investigations, *Int. J. Mol. Sci. (International Journal of Molecular Sciences)*, **2025**, *26*, 8368. <https://doi.org/10.3390/ijms26178368> (IF 2024=**4.9**)

3. Amariuca-Mantu, D.; **Antoci, V.**; Sardaru, M.C.; Al Matarneh, C.M.; Mangalagiu, I.I.; Danac, R.: Fused pyrrolo-pyridines and pyrrolo-(iso) quinoline as anticancer agents, *Physical Sciences Reviews*, *8*(9), 2583-2645, **2023**. <https://doi.org/10.1515/psr-2021-0030> (IF 2024=**0**)  
<https://www.degruyter.com/journal/key/psr/8/9/html>

4. Diaconu, D.; Mangalagiu, V.; Dunca, S.; Amăriucăi-Mantu, D.; **Antoci, V.**; Roman, T.; Mangalagiu, I.I.: Ultrasound assisted synthesis of hybrid quinoline anchored with 4-R-benzenesulfonamide moiety with potential antimicrobial activity, *Heliyon*, 9, e21518, **2023**. <https://doi.org/10.1016/j.heliyon.2023.e21518> (IF 2024 = **3.6**)
5. Oniciuc, L.; Amariuca-Mantu, D.; Diaconu, D.; Mangalagiu, V.; Danac, R.; **Antoci, V.**; Mangalagiu, I.I.: Benzoquinoline Derivatives: An Attractive Approach to Newly Small Molecules with Anticancer Activity, *Int. J. Mol. Sci. (International Journal of Molecular Sciences)*, **2023**, 24, 8124. <https://doi.org/10.3390/ijms24098124>. (IF 2024= **4.9**) (corresponding author)
6. Diaconu, D.; **Antoci, V.**; Mangalagiu, V.; Amariuca-Mantu, D.; Mangalagiu, I.I.: Quinoline-imidazole/benzimidazole derivatives as dual-/multi-targeting hybrids inhibitors with anticancer and antimicrobial activity, *Scientific Reports*, (2022) 12:16988. <https://doi.org/10.1038/s41598-022-21435-6>. (IF 2024= **3.9**)
7. Diaconu, D.; Amariuca-Mantu, D.; **Antoci, V.**; Ciorteanu, R.; Mangalagiu, V.; Mangalagiu, I.I.: Design and synthesis of new hybrid pyridine-imidazolium/benzimidazolium salts with antibacterial activity, *Rev. Roum. Chim.*, **2022**, 67(1-2), 85-88, DOI: 10.33224/rch.2022.67.1-2.07. (IF 2024= **0.6**)
8. **Antoci, V.**; Oniciuc, L.; Amariucăi-Mantu, D.; Moldoveanu, C.; Mangalagiu, V.; Amarandei, A.M.; Lungu, C.N.; Dunca, S.; Mangalagiu, I.I.; Zbancioc, Ghe.: *Benzoquinoline Derivatives: A Straightforward and Efficient Route to Antibacterial and Antifungal Agents*, *Pharmaceuticals*, **14** (4), 335, **2021**. (IF 2024=**4.8**) ISSN: 1424-8247. <https://doi.org/10.3390/ph14040335>.
9. Diaconu, D.; Amăriucăi-Mantu, D.; Mangalagiu, V.; **Antoci, V.**; Zbancioc, G.; Mangalagiu, I.I.: Ultrasound assisted synthesis of hybrid quinoline-imidazole derivatives: a green synthetic approach, *RSC Adv*, **2021**, 11, 38297. <https://doi.org/10.1039/D1RA07484A> (IF 2024=**4.6**)
10. Amăriucăi-Mantu, D.; Mangalagiu, V.; Ciobanu, C.-I.; **Antoci, V.**: Hybrid Pyridine Bis-Anthracene-Imidazolium Salt: NMR Studies on Zn-Acetate Complexation, *Molbank* **2021**, 2021, M1280. <https://doi.org/10.3390/M1280> (corresponding author) (IF 2024= **0.4**)

**D. Lucrări publicate în ultimii 5 ani (2021-2025) în reviste și volume de conferințe cu referenți (neindexate)**

**- Reviste (proceedings)**

1. Mangalagiu, V.; Amariuca-Mantu, D.; **Antoci, V.**; Mangalagiu, I.I.: BENZIMIDAZOLE – PYRIDINE: A NEW TYPE OF HIGHLY SENSITIVE CHEMOSENSOR FOR ZN<sup>2+</sup>, 24, 6.2, **2024** (Proceedings of 24th International Multidisciplinary Scientific GeoConference SGEM 2024) (Proceedings Paper) Doi 10.5593/sgem2024v/6.2/s23.01

ISBN 978-619-7603-78-1

2. Mangalagiu V.; Amariuca-Mantu D.; Diaconu D.; **Antoci V.**; Mangalagiu I.I.: MICROWAVE AND ULTRASOUND ASSISTED SYNTHESIS AS ECOLOGICALLY FRIENDLY METHODS IN NITROGEN HETEROCYCLIC CHEMISTRY, 24, 6.2, 2024 **2024**. (Proceedings of 24th International Multidisciplinary Scientific GeoConference SGEM 2024) (Proceedings Paper)DOI 10.5593/sgem2024v/6.2/s23.04; DOI Issue 10.5593/sgem2024v/6.2

ISSN 1314-2704, ISBN 978-619-7603-78-1

3. Diaconu, D.; Mangalagiu, V.; Amariuca-Mantu, D.; **Antoci, V.**; Mangalagiu, I.: SIX-MEMBERED HETEROCYCLIC SULFONAMIDES: SYNTHESIS, CHARACTERISATION AND ANTIMICROBIAL PROPERTIES, 23 (6.2), **2023**, DOI: 10.5593/sgem2023V/6.2/s25.45, DOI Issue:

10.5593/sgem2023v/6.2, ISSN: 1314-2704, ISBN: 978-619-7603-66-8 (Proceedings of 23rd International Multidisciplinary Scientific GeoConference SGEM 2023)

4. Mangalagiu, V.; Amariuca-Mantu, D.; **Antoci, V.**; Diaconu, D.; Danac, R.; Moldoveanu, C.; Zbancioc, Ghe.; Mangalagiu, I.I.: *Ecologically friendly methods used in heterocyclic chemistry*, EEC-2022 Abstract Book Ecological and environmental chemistry, Ediția 7, Vol.1, **2022**, pag 52. DOI: <http://dx.doi.org/10.19261/eec.2022.v1> (proceedings la **7th International Conference Ecological and Environmental Chemistry 2022**, March 3-4, **2022**, Chisinau, Republic of Moldova. (Plenary lecture, PL, pag. 11). <http://eec-2022.mrda.md/>)

5. Oniciuc, L.; **Antoci, V.**; Amariuca-Mantu, D.; Diaconu, D.; Ciobanu, C.; Mangalagiu, V.; Mangalagiu, I.I.: *Novel benzo[f]quinoline derivatives with antimicrobial properties*, ACTA CHEMICA IASI, 30(2), 163, **2022**. DOI: [10.47743/achi-2022-2-0008](https://doi.org/10.47743/achi-2022-2-0008) (proceeding la *Sesiunea de comunicări științifice a studenților, masteranzilor și doctoranzilor*, Ediția XIII, pag. 22, 28 Octombrie 2022, Iasi, Romania. (Comunicare orală CO-09)) (Abstracting & Indexing: Celdes, Chemical Abstracts Service (CAS), Chemical Abstracts Service (CAS) – SciFinder, CNPIEC, EBSCO (relevant databases), EBSCO Discovery Service, Google Scholar, J-Gate, Primo Central (ExLibris), Summon (Serials Solutions/ProQuest), TDOne (TDNet), TEMA (Technology and Management), WorldCat (OCLC)).

6. Ciorteanu, R.; Ciobanu, C.; **Antoci, V.**; Mangalagiu, I.I.; Danac, R.: *Synthesis of new fused heterocycles as potential anticancer agents*, ACTA CHEMICA IASI, 30(2), 155, **2022**. DOI: [10.47743/achi-2022-2-0008](https://doi.org/10.47743/achi-2022-2-0008) (proceeding la *Sesiunea de comunicări științifice a studenților, masteranzilor și doctoranzilor*, Ediția XIII, pag. 6, 28 Octombrie **2022**, Iasi, Romania. (Comunicare orală CO-01)) (IF 2024= 0.3).

#### - Selecție cu maximum 20 lucrări în volume de conferințe

1. Mangalagiu, V.; Zbancioc, Ghe.; Moldoveanu, C.; Amariuca-Mantu, D.; **Antoci, V.**; Mangalagiu, I.I. Multitarget azaheterocycles for anticancer and antimicrobial diseases, International Congress MEDICINE, MOLECULAR AND ENVIRONMENTAL SCIENCES 2025 “From chemistry to medicine – 35 years of Moldo-Romanian scientific collaboration”, November 10-15, **2025**. Chișinău, Republic of Moldova. (Conference, PL-2, pag. 11).

<https://icmpp.ro/medmolmed2025/files/Program-MEDMOLMED.pdf>

DOI: <https://doi.org/10.19261/medmol25>

2. Mangalagiu, V.; **Antoci, V.**; Amariuca-Mantu, D.; Mangalagiu, I. I.: Quinoline derivatives with potential antimicrobial activity, *International Congress MEDICINE, MOLECULAR AND ENVIRONMENTAL SCIENCES 2025 “From chemistry to medicine – 35 years of Moldo-Romanian scientific collaboration”*, November 10-15, **2025**. Chișinău, Republic of Moldova. (Conference, PL-2, pag. 11).

<https://icmpp.ro/medmolmed2025/files/Program-MEDMOLMED.pdf>

DOI: <https://doi.org/10.19261/medmol25>

3. Mangalagiu, I.I.; Amariuca-Mantu, D.; **Antoci, V.**; Zbancioc, Ghe.; Moldoveanu, C.; Mangalagiu, V. MULTIPLE TARGET LIGANDS WITH AZAHEROCYCLES SKELETON, International Conference Progress in Organic and Macromolecular Compounds 30th Edition, Iasi, Romania, September 23 - 26, **2025**. (Conference, L6).

<https://icmpp.ro/macroiiasi2025/index.php>

[https://icmpp.ro/macroiiasi2025/files/volum%20MacroIasi%202025\\_v3.pdf](https://icmpp.ro/macroiiasi2025/files/volum%20MacroIasi%202025_v3.pdf)

4. Mangalagiu, I.I.; Amariuca-Mantu, D.; **Antoci, V.**; Zbancioc, Ghe.; Moldoveanu, C.; Cucu, D.; Danac, R.; Mangalagiu, V. Process for obtaining a new class of anthracene-imidazole compounds with antituberculosis activity. *European Exhibition of Creativity and Innovation, Euroinvent 2025*, May 8-

10 2025, Iasi, Romania. Class: Inovative Research, pag. 375. RO-129. Poster, ISSN Print: 2601-4564, Online: 2601-4572

[https://www.euroinvent.org/cat/EUROINVENT\\_2025.pdf](https://www.euroinvent.org/cat/EUROINVENT_2025.pdf)

5. Mangalagiu, V.; **Antoci, V.**; Amăriucăi-Mantu, D.; Mangalagiu, I. I.: PYRIDINE-IMIDAZOLIUM SALTS AND YLIDES: A NMR STUDY OF ZN-ACETATE COMPLEXATION. *Central European NMR Symposium & Bruker Users' Meeting - CEUM 2024*, September 18-19, 2024. Rijeka, Croatia. (Poster, P17, pag. 32). ISBN 978-953-8334-11-5

<https://ceum2024.hkd.hr/programme/>

[https://ceum2024.hkd.hr/CEUM2024\\_Preliminary\\_Abstracts.pdf](https://ceum2024.hkd.hr/CEUM2024_Preliminary_Abstracts.pdf)

6. Mangalagiu, V.; Amariuca-Mantu, D.; **Antoci, V.**; Mangalagiu, I.I.: (Benzo) / Imidazole)-Pyridine: a new type of highly sensitive chemosensor for Zn<sup>2+</sup>. *XXIVth Edition of the International Scientific Conference SGEM Vienna GREEN 2024*, November 27 – 30 2024, Schönbrunn Palace, Vienna, Austria. (Poster)

DOI 10.5593/sgem2024v/6.2/s23.01, ISSN 1314-2704, ISBN 78-619-7603-78-1

<https://sgemviennagreen.org/index.php/sgemviennagreen-deadlines/plenary-programme>

7. Savu, M.; **Antoci, V.**; Amăriucăi-Mantu, D.; Danac, R.; Diaconu, D.; Ciobanu, C.-I.; Mangalagiu, I.I. NOVEL PHTHALAZINO-ACETOPHENONE HYBRIDS: DESIGN, SYNTHESIS, AND STRUCTURAL CHARACTERIZATION, *OPEN DOOR TO THE FUTURE SCIENTIFIC COMMUNICATIONS OF YOUNG RESEARCHERS, MacroYouth 2025, 6th Edition*, Iasi, November 19, 2025. (poster PP17). (book of abstracts pag. 91-92)

<https://icmpp.ro/macroyouth2025/files/ProgramandBookofAbstractMacroYouth2025.pdf>

<https://icmpp.ro/macroyouth2025/index.php>

8. Diaconu, D.; Amăriucăi-Mantu, D.; Mangalagiu, V.; **Antoci, V.**; Mangalagiu, I.I. Green synthesis of new molecules with sulfonamide moiety as versatile derivatives with biological activity in complex diseases, Abstract in Book of Abstracts of RARE-2024, 1st-Edition, OC-07, pp. 13-14, 2024. (Comunicare orală). *Recent Advances in Natural Sciences Yield the Future for the European Citizens and Society - Ready For Europe, RARE-2024*, 1st Edition, Iași, România, 12-13 Decembrie 2024

[https://recent-air.uaic.ro/Ready\\_for\\_Europe\\_Conference\\_2024.php](https://recent-air.uaic.ro/Ready_for_Europe_Conference_2024.php)

9. **Antoci, V.**; Amariuca-Mantu, D.; Diaconu, D.; Danac, R.; Ciobanu, C.; Mangalagiu, V.; Mangalagiu, I.I., Ultrasound irradiation: application in synthesis of new hybrid azaheterocyclic compounds by click chemistry, *IasiCHEM 2024 Conference 6th Edition*, 31 Oct - 01 Nov 2024, Iasi, Romania (poster PI-III-1) (book of abstract pag 38). <https://www.chem.uaic.ro/ro/manifestari/zu-2024.html>

10. Mangalagiu, V., Diaconu, D., Moldoveanu, C., Zbancioc, G., Dănac, R., Amăriucăi-Mantu, D., **Antoci, V.**, Mangalagiu, I.I.: Hybrid and chimeric nitrogen heterocycles with biological activity, *NEW FRONTIERS IN NATURAL PRODUCT CHEMISTRY 2023*, 12-13 Octombrie, Chișinău, Republica Moldova, pag. 8, 2023. <https://ichem.md/seminar-stiintific-noi-frontiere-in-chimia-compusilor-naturali> (Oral presentation) (Abstract in Book of Abstracts) <https://doi.org/10.19261/nfnpc.2023.ab01>

11. Mangalagiu, V., **Antoci, V.**, Diaconu, D., Mangalagiu, I.I.: Hybrid quinoline derivatives with antimicrobial activity, *49th IUPAC World Chemistry Congress - IUPAC CHAINS 2023*, 20-25 August 2023, The Hague, The Netherlands, 2023, P1-B0027, page 568, 2023. (Poster) (Abstract in Book of abstracts) <https://iupac2023.org/>

12. Mangalagiu, V.; **Antoci, V.**; Diaconu, D.; Mangalagiu, I.I.: Chemistry and Antimicrobial Activity of Hybrid Quinoline - Triazole Derivatives, *World Chemistry Forum*, Budapest, Hungary, 12-14 April, 2023. (pag. 77) (book of abstract) (Poster presentation) <https://istci.org/wcf2023/index.asp>

13. Mangalagiu, V.; Diaconu, D.; Amariuca-Mantu, D.; **Antoci, V.**; Danac, R.; Moldoveanu, C.; Zbancioc, Ghe.; Mangalagiu, I.I.: New (Di-)Azine and (Di-)Azole with antituberculosis activity, *MDIPI World Tuberculosis Day Webinar 2023*, March 24, **2023**. Conference.  
<https://wtdw23.sciforum.net/>
14. **Antoci, V.**; Amăriucăi-Mantu, D.; Diaconu, D.; Oniciuc, L.; Dănac, R.; Ciobanu, C.; Mangalagiu, V.; Mangalagiu, I.: Anticancer activity of new hybrid derivatives with benzo[f]quinoline skeleton, *CUKUROVA 9th INTERNATIONAL SCIENTIFIC RESEARCHES CONFERENCE*, October 9-11, Adana, Turcia, **2022**, pag 148, abstract book, (oral presentation/on-line) (ISBN 978-625-8246-29-2), [www.iksadkongre.net](http://www.iksadkongre.net)
15. **Antoci, V.**, Amăriucăi-Mantu, D., Diaconu, D., Dănac, R., Mangalagiu, V., Mangalagiu, I.: Novel benzo[f]quinoline compounds with vinyl chain: synthesis, characterization and anticancer evaluation, *INTERNATIONAL SCIENTIFIC RESEARCH CONGRESS-XII*, 13-14 august, **2022**, Delhi, India (participare on-line; prezentare orală, nr. 656, pag. 656-657), Proceedings Book, ISBN 978-625-8323-42-9. <https://www.umteb.org/>
16. Diaconu, D., Amăriucăi-Mantu, D., Mangalagiu, V., **Antoci, V.**, Dunca, S.I., Mangalagiu, I.I.: M<sup>2+</sup> complexation of hybrid quinoline-sulfonamide derivatives: an useful approach for increasing antimicrobial activity, *22nd Tetrahedron Symposium Catalysis for a Sustainable World*, 28 Iunie-1 Iulie 2022, Lisabona, Portugalia (Poster presentation P2.33) (Abstract in Book of Abstracts of 22nd Tetrahedron Symposium, P2.33, **2022**). <https://www.elsevier.com/events/conferences/tetrahedron-symposium>
17. Mangalagiu, V.; Diaconu, D.; Amariuca-Mantu, D.; **Antoci, V.**; Mangalagiu, I.I.: Hybrid Five and Six Membered Ring Nitrogen Heterocycles with Antimicrobial and Anticancer Activity, *MEDCHEMMEET2022- INTERNATIONAL MEET ON MEDICINAL CHEMISTRY, DRUG DISCOVERY & DRUG DELIVERY*, June 23-25, 2022. COPENHAGEN, DENMARK. (Poster presentation, P4- pag. 3).  
<https://www.albedomeetings.com/cms/pdfs/MEDCHEMMEET2022-tentative-program.pdf>  
*MEDCHEMMEET2022*, Abstract Book, pag.19  
[https://www.albedomeetings.com/cms/pdfs/MEDCHEMMEET2022\\_abstract\\_book.pdf](https://www.albedomeetings.com/cms/pdfs/MEDCHEMMEET2022_abstract_book.pdf)
18. Mangalagiu, I.I.; Mangalagiu, V.; Amariuca Mantu, D.; **Antoci, V.**; Diaconu, D.: New Azaheterocycles Derivatives: Design, Synthesis and Applications, *MEDCHEMMEET2022- INTERNATIONAL MEET ON MEDICINAL CHEMISTRY, DRUG DISCOVERY & DRUG DELIVERY*, June 23-25, 2022. COPENHAGEN, DENMARK. (Invited (plenary) lecture, I-3, pag. 2).  
<https://www.albedomeetings.com/cms/pdfs/MEDCHEMMEET2022-tentative-program.pdf>  
*MEDCHEMMEET2022*, Abstract Book, pag.8  
[https://www.albedomeetings.com/cms/pdfs/MEDCHEMMEET2022\\_abstract\\_book.pdf](https://www.albedomeetings.com/cms/pdfs/MEDCHEMMEET2022_abstract_book.pdf)
19. Mangalagiu, V.; Amariuca-Mantu, D.; **Antoci, V.**; Diaconu, D.; Danac, R.; Moldoveanu, C.; Zbancioc, Ghe.; Mangalagiu, I.I.: Ecologically friendly methods used in heterocyclic chemistry, *7th International Conference Ecological and Environmental Chemistry 2022*, March 3-4, 2022, Chisinau, Republic of Moldova. (Plenary lecture, PL, pag. 11). <http://eec-2022.mrda.md/>; EEC-2022 Abstract Book Ecological and environmental chemistry, Ediția 7, Vol.1, 2022, pag 52. DOI: <http://dx.doi.org/10.19261/eec.2022.v1>
20. Mangalagiu I.I., Amariuca-Mantu, D.; **Antoci, V.**; Danac, R.; Mangalagiu, V.; Moldoveanu, C.; Zbancioc. Ghe: Hybrid five- and six-member ring azaheterocycles: synthesis and applications. *Progress in Organic and Macromolecular Compounds 28-th Ed.*, Iasi, Romania, October 7-9, **2021**. (Plenary lecture, PL, pag. 25-26). Book of Abstracts / editors: Marcela MIHAI, Radu-Dan RUSU; ISSN 2810 – 2347 ISSN – L 2810 – 2126  
<https://icmpp.ro/macroiasi2021/program.php>; <https://icmpp.ro/macroiasi2021/proceedings.php>

#### **E. Brevete obținute în întreaga activitate**

1. Mangalagiu, I.I.; Amăriucăi-Mantu, D.; **Antoci, V.**; Zbancioc, Ghe.; Moldoveanu, C.; Cucu, D.; Dănac, R.; Mangalagiu, V.: *Obtaining class of anthracene-imidazole compounds with anti-tuberculosis effect by performing N-alkylation imidazole and benzimidazole with 9-chloromethyl-anthracene, and subjecting intermediates to quaternization/Procedeu pentru obținerea unei noi clase de compuși antracen-imidazolici cu activitate antituberculoasă*, Patent RO (Oficiul de Stat pentru Inventii si Marci-OSIM), no. RO134192-A0/2020, Derwent Primary Accession Number: 2020-605892, **2020**. (Cerere brevet)  
Property Rights Owner: Universitatea „Alexandru Ioan Cuza” din Iași, România

**Data:**

**23.02.2026**