



**Anexa nr. 1 – Cerere de premiere\***

**1. Candidat**

Nume: Alexa

Nume anterioare (dacă este cazul): Leu

Prenume: Rebeca

Doctor din anul: 2024

Poziția ocupată: Asistent Universitar

Instituția: Universitatea Politehnica București

Telefon mobil: 0

Adresa de e-mail: r

**2. Ediția “Gala Cercetării Românești”: Editia 2024**

**3. Premiul și categoria pentru care aplică (individual sau echipă de cercetare): individual, Chimie**

**4. Lider de echipă, dacă este cazul:**

**5. Componența echipei de cercetare, dacă este cazul (numele membrilor echipei, poziția ocupată, anul ultimei diplome acordate):**

**6. O descriere a celor mai importante realizări științifice din ultimii 5 ani (max. 4 pag., format A4, caractere Times New Roman, 12 puncte, spațiere între linii de 1,5 și margini de 2 cm)\*\*.**

**7. Curriculum Vitae narativ al candidatului “individual” sau al fiecărui membru al echipei de cercetare, în cazul candidatului “echipă de cercetare”, din care să reiasă rezultatele activității de cercetare din ultimii 5 ani, conform indicatorilor cantitativi din Anexa nr. 2 la regulament și criteriilor de evaluare calitativă prevăzute în Anexa nr. 3 la regulament.**

**8. Lista publicațiilor candidatului “individual” sau a fiecărui membru al echipei de cercetare, în cazul candidatului “echipă de cercetare”, cu evidențierea publicațiilor relevante ale candidatului în ultimii 5 ani și a publicațiilor comune ale membrilor unei echipe de cercetare în cazul candidatului “echipă de cercetare”. Se menționează și un link al paginii web unde se regăsesc publicațiile candidatului.**

**9. Lista proiectelor de cercetare câștigate de candidat și valoarea acestora.**

**10. Lista brevetelor depuse și a celor acceptate, dacă este cazul.**

\* Se redactează în limba engleză. Prin excepție, redactarea cererii de premiere se face în limba română pentru cererile din domenii cu specific românesc: limba și literatura română și dreptul românesc.

\*\* Rezultatele activității de cercetare sunt evaluate conform Anexei nr. 3 la Regulamentul de organizare și funcționare a programului Gala Cercetării Românești.

## **ALEXA (LEU) Rebeca – Narrative CV**

(b. 09 May 1992, Nehoiu, Buzău)

Alexa (Leu) Rebeca was born in Nehoiu - Buzau in 1992. She attended the courses of the National University of Science and Technology Politehnica Bucharest, department of *Polymer Science and Engineering* (Bachelor's degree **2016**). In 2018 she obtained her master's degree at **University of Medicine and Pharmacy Carol Davila Bucharest speciality - Medical Biophysics and Cellular Biotechnology**. In September 2023, she publicly presented her doctoral thesis in the field of Chemical engineering, obtained with the qualification SUMMA CUM LAUDE, the title of the paper: ***BIOPOLYMER COMPOSITES FOR MEDICAL APPLICATIONS OBTAINED BY 3D PRINTING***.

In collaboration with ICECHIM (National Institute for Research and Development in Chemistry and Petrochemistry), Genetic Lab (the first private laboratory of genetic diagnosis in Romania) and under the guidance of Prof. Horia Iovu, Rebeca wrote "PED - Innovative 3D printed nanocomposite constructions obtained from marine resources (alginate, salecan) and natural clay with specific applications in bone regeneration – 3D ALSAC (2020-2021)". Based on this funded project, Rebeca developed her PhD thesis with the following results:

- Published articles:

1. R.L. Alexa, H. Iovu, J. Ghitman, A. Serafim, C. Stavarache, M.M. Marin, R. Ianchis, 3D-printed gelatin methacryloyl-based scaffolds with potential application in tissue engineering, *Polymers*, 2021, 13(5), 727. (IF 4,967)
2. R.L. Alexa, H. Iovu, B. Trica, C. Zaharia, A. Serafim, E. Alexandrescu, I.C. Radu, G. Vlasceanu, S.Preda, C.M. Ninciuleanu, R. Ianchis, Assessment of naturally sourced mineral clays for the 3Dprinting of biopolymer-based nanocomposite inks, *Nanomaterials*, 2021, 11(3), 703. (IF 5.719)
3. R.L. Alexa, H. Iovu, M.C. Nicolae, I.C. Mihaescu, E. Alexandrescu, R. Ianchis, „3D printing of super concentrated alginate clay ink with potential application in regenerative medicine”, *UPB Scientific Bulletin, Series B: Chemistry and Materials*, 2021
4. R.L. Alexa, R. Ianchis, D. Savu, M. Temelie, B. Trica, A. Serafim, G.M. Vlasceanu, E. Alexandrescu, S.Preda, H. Iovu, &quot; 3D Printing of Alginate-Natural Clay Hydrogel-Based Nanocomposites, *Gels*, 2021, 7(4), 211. (IF 4.432)

5. R. Leu Alexa, A. Cucuruz, C.-D. Ghițulică, G. Voicu, L.-R. Stamat, S. Dinescu, G.M. Vlasceanu, C. Stavarache, R. Ianchis, H. Iovu, M. Costache, „3D Printable Composite Biomaterials Based on GelMA and Hydroxyapatite Powders Doped with Cerium Ions for Bone Tissue Regeneration”, *International Journal of Molecular Sciences*, 2022, 23(3), 1841. (IF 6.208)
6. R.L. Alexa, A. Cucuruz, C.D. Ghițulică, G. Voicu, L.R. Stamat (Balahura), S. Dinescu, G. M. Vlasceanu, H. Iovu, A. Serafim, R. Ianchis, L.T. Ciocan, M. Costache, “3D Printed Composite Scaffolds of GelMA and Hydroxyapatite Nanopowders Doped with Mg/Zn Ions to Evaluate the Expression of Genes and Proteins of Osteogenic Markers”, *Nanomaterials*, 2022, 12(19), 3420. (IF 5.719)
7. M.M. Marin, R. Ianchis, R. Leu Alexa, I.C. Gifu, M.G.A. Kaya, D.I. Savu, R.C. Popescu, E. Alexandrescu, C.M. Ninciuleanu, S. Preda, M. Ignat, R. Constantinescu, H. Iovu, „Development of New Collagen/Clay Composite Biomaterials”, *International Journal of Molecular Sciences*, 2022, 23 (10), 401
8. P. Stanescu, I.C. Radu, R. Alexa, A. Hudita, E. Tanasa, J. Ghitman, O. Stoian, A. Tsatsakis, O. Ginghina, C. Zaharia, M. Shtilman, Y. Mezhuev, B. Galateanu, (2021), “Novel chitosan and bacterial cellulose biocomposites tailored with polymeric nanoparticles for modern wound dressing development”, *Drug Delivery*. 2021, 28, 1932-1950
9. Marin, M.M.; Albu Kaya, M.; Kaya, D.A.; Constantinescu, R.; Trica, B.; Gifu, I.C.; Alexandrescu, E.; Nistor, C.L.; Alexa, R.L.; Ianchis, R. Novel Nanocomposite Hydrogels Based on Crosslinked Microbial Polysaccharide as Potential Bioactive Wound Dressings. *Materials* 2023, 16, 982. <https://doi.org/10.3390/ma16030982>
10. Ianchis, R.; Alexa, R.L\*.; Gifu, I.C.; Marin, M.M.; Alexandrescu, E.; Constantinescu, R.; Serafim, A.; Nistor, C.L.; Petcu, C. Novel Green Crosslinked Salecan Hydrogels and Preliminary Investigation of Their Use in 3D Printing. *Pharmaceutics* 2023, 15, 373. <https://doi.org/10.3390/pharmaceutics15020373>
11. Marin, M.M.; Gifu, I.C.; Pircalabioru, G.G.; Albu Kaya, M.; Constantinescu, R.R.; Alexa, R.L.; Trica, B.; Alexandrescu, E.; Nistor, C.L.; Petcu, C.; Ianchis, R. Microbial Polysaccharide-Based Formulation with Silica Nanoparticles; A New Hydrogel Nanocomposite for 3D Printing. *Gels* 2023, 9, 425. <https://doi.org/10.3390/gels9050425>

12. Raluca Ianchis, Maria Minodora Marin\*, **Rebeca Leu Alexa\***, Ioana Catalina Gifu, Elvira Alexandrescu, Gratiela Gradisteanu Pircalabioru, George Mihail Vlasceanu, George Mihail Teodorescu, Andrada Serafim, Silviu Preda, Cristina Lavinia Nistor, and Cristian Petcu **Nanoclay-reinforced alginate/salecan composite inks for 3D printing applications**, International Journal of Bioprinting, June 2023 <https://doi.org/10.36922/ijb.0967>

- List of conferences:

1. Biopolymer composites for medical applications obtained by 3D printing, R.L. Alexa, H. Iovu, J. Ghitman, C. Stavarache, M.M. Marin, Romanian International Conference on Chemistry and Chemical Engineering - RICCCE21
2. Wound dressing based on bacterial cellulose R. Leu, I. Radu, P.O. Stanescu, B. Galateanu, A. Hudita, E. Tanasa, G. Jana, H. Iovu, C. Zaharia Romanian International Conference on Chemistry and Chemical Engineering - RICCCE21
3. Novel Biopolymeric Based Composites Inks for Tissue Engineering Application, R.L. Alexa, H. Iovu, C. Zaharia, C. Ninciuleanu, B. Trica, E. Alexandrescu, S. Preda, A. Serafim, I.-C. Radu, G. Vlasceanu, L. Miclea, R. Ianchis, EmergeMAT, 3rd INTERNATIONAL CONFERENCE ON EMERGING TECHNOLOGIES IN MATERIALS ENGINEERING, 29-30 October, Bucharest, Romania, 2020
4. Innovative Hydrogel Based Inks with Application in Tissue Engineering, R.L. Alexa, H.Iovu, I.C. Radu, G. Vlasceanu, C.M. Ninciuleanu, E.a Alexandrescu, C. Mihaescu, C. Scomoroscenco, C.L. Nistor, C. Petcu, R. Ianchis, "PRIORITATILE CHIMIEI PENTRU O DEZVOLTARE DURABILA" PRIOCHEM, XVIth Edition, Bucharest, Romania, 2020
5. 3D Printable ink based on alginate and layered silicates, R.L. Alexa, H. Iovu, G. Vlasceanu, A. Serafim, E. Alexandrescu, S. Preda, R. Ianchis, NeXT-Chem III, Bucharest, Romania, 2021
6. Scaffolds obtained by 3D Printing based on alginate-clay hybrid nanocomposites, R.L. Alexa, H. Iovu, G. Vlasceanu, A. Serafim, E. Alexandrescu, S. Preda, R. Ianchis, Bucharest Polymer Conference 2nd Edition, University POLITEHNICA of Bucharest, Romania, 10 - 11 June, 2021
7. Investigation of crosslinked hydrogels based on Salecan biopolymer, R. Ianchis, C.M. Ninciuleanu, E. Alexandrescu, I.C. Gifu, R. Gabor, C. Mihaescu, C. Scomoroscenco, S.

- Nitu, C. Nistor, C. Petcu, H. Iovu, R.L. Alexa, Bucharest Polymer Conference 2nd Edition, University POLITEHNICA of Bucharest, Romania, 10 - 11 June, 2021
8. *Development of New Collagen/Clay Composite Biomaterials*, M.M. Marin, R. Leu, M.G. Albu Kaya, E. Alexandrescu, S. Preda, H. Iovu, R. Ianchiș, Bucharest Polymer Conference 2nd Edition, University POLITEHNICA of Bucharest, Romania, 10 - 11 June, 2021
  9. 3D printing of novel polysaccharide based biomaterials foreseen for biomedical applications, R.L. Alexa, I.C. Gifu, C. Ninciuleanu, E. Alexandrescu, C. Scomoroscenco, C. Mihaescu, S. Burlacu, C.L. Nistor, C. Petcu, H. Iovu, R. Ianchis 4th International Conference on Emerging Technologies in Materials Engineering EmergeMAT, Bucharest, Romania, 4-5 November, 2021
  10. Synthesis of platelet rich plasma enriched inorganic advanced material with application in regenerative medicine, R.L. Alexa, C. Ninciuleanu, E. Alexandrescu, C. Mihaescu, S. Preda, C.L. Nistor, C. Petcu, H. Iovu, L. Savu, R. Ianchis, 4th International Conference on Emerging Technologies in Materials Engineering EmergeMAT, Bucharest, Romania, 4-5 November, 2021
  11. Synthesis and characterization of green crosslinked hydrogels, M.M. Marin, I.C. Gifu, C. Ninciuleanu, E. Alexandrescu, C. Scomoroscenco, S. Burlacu, C.L. Nistor, C. Petcu, H. Iovu, R.L. Alexa, R. Ianchis, 4th International Conference on Emerging Technologies in Materials Engineering EmergeMAT, Bucharest, Romania, 4-5 November, 2021
  12. APMG 2023 Novel 3D Printed Polysaccharide/Clay Biomaterials, Maria Minodora Marin, Madalina Albu Kaya, Cristina Stavarache, Rebeca Leu Alexa, Ioana Catalina Gifu, Elvira Alexandrescu, Silviu Preda, Andrada Serafim, Horia Iovu, Raluca Ianchis
  13. APMG 2023 3D Printable inks based on GelMA, Alginate and inorganic fillers, Rebeca Leu Alexal, Horia Iovu1,3, Raluca Ianchis2, Andrada Serafim1, George Mihail Vlaseanu1
  14. 15th National Conference of Biophysics, 7-10 september 2018, Multiparametric Evaluation of Platelets from Chronic Myeloproliferative Neoplasm Patients
  15. CONGRESS OF THE UNIVERSITY OF MEDICINE AND PHARMACY CAROL DAVILA BUCURESTI, VI edition , 7-9 JUNE 2018 The Resting Membrane Potential Evaluation of Platelets from Chronic Myeloproliferative Neoplasms Patients - **1st Place - Young Researcher - Preclinical specialties**

16. The resting membrane potential evaluation of platelets from chronic myeloproliferative neoplasms patients - abstract published in MAEDICA a Journal of Clinical Medicine volume13(16)Supplement 2018
17. Congress of the European Hematology Association Stockholm, Suedia , Iunie 14 - 17, 2018 - abstract published in HemaSphere 2(S1) – 2018, Evaluation of platelet receptor expression in chronic lymphoid leukemia treated with ibrutinib
18. XXXVII World Congress of the International Society of Hematology (ISH 2018), 13-16 september 2018, Vancouver, Canada - The assessment of JAK 2 mutation role in platelet membrane fluidity changes in chronic myeloproliferative neoplasms
  - List of patent applications:
    1. “Compoziție și procedeu de obținere a unor hidrogeluri pe bază de salean și de utilizare a acestora pentru manufacturare aditivă”, R. Ianchiș, R.L. Alexa, M.M. Marin, C.I. Gîfu, C.M. Ninciuleanu, E. Alexandrescu, C. Scmoroscenco, S.G. Burlacu, C.I. Mihăescu, C.L. Nistor, C. Petcu, H. Iovu, A2021-00643/25.10.2021
    2. Compoziții și procedeu de obținere a unor hidrogeluri compozite pe bază de polizaharide naturale și aplicarea acestora în procesul de imprimare tridimensională, R. Ianchis, M.M. Marin, R.L. Alexa, C.I. Gifu, C.M. Ninciuleanu, E. Alexandrescu, C. Scmoroscenco, S.G. Burlacu, C.I. Mihaescu, C.L. Nistor, C. Petcu, H. Iovu, A 2022-00127/16.03.2022
  - List of awards:
    1. Chemical Romanian Society Price received at the conference Priorities of Chemistry for a Sustainable Development - PRIOCHEM XVI ed., Bucharest, Romania, 28-30 October (2020) for the work entitled “Innovative Hydrogel Based Inks with Application in Tissue Engineering”, R.L. Alexa, H. Iovu, I.C. Radu, G. Vlasceanu, C.M. Ninciuleanu, E. Alexandrescu, C. Mihaescu, C. Scmoroscenco, C. Nistor, C. Petcu, R. Ianchiș
    2. Special price received at the conference 4th International Conference on Emerging Technologies in Materials Engineering EmergeMAT, Bucharest, Romania, 4-5 November, (2021) with the work entitled „Synthesis and Characterization of Green Crosslinked Hydrogels”, M.M. Marin, I.C. Gifu, C. Ninciuleanu, E. Alexandrescu, C. Scmoroscenco, S. Burlacu, C.L. Nistor, C. Petcu, H. Iovu, R.L. Alexa, R. Ianchis

3. Excellence Diploma and Gold Medal received at International Salon of Scientific Research, Innovation and Invention, PRO INVENT, XX Edition, 26-28 octomber (2022) and Silver medal at Euroinvent 2023, 15th European Exhibition of Creativity and Innovation, Iași, Romania, for the work entitled „Compositions and process for obtaining composite hydrogels based on natural polysaccharides and their application in the three-dimensional printing process”, R. Ianchiș, M.M. Marin, R. Leu Alexa, C.I. Gifu, C.M. Ninciuleanu, E. Alexandrescu, C.Scomorosenco, S.G. Burlacu, C.I. Mihăescu, C.L. Nistor, C. Petcu, H. Iovu

Rebeca published 11 articles rated ISI with 3846 reads and 154 citations. The reaserch gate profile can be accessed here: <https://www.researchgate.net/profile/Rebeca-Alexa> .

With the developed materials and the publised articles, Rebeca filed two patent applications and won three awards.

The most important scientific realizations from the last five years are presented in the 5<sup>th</sup> chapter of my PhD Thesis named “**Biopolymer Composites For Medical Applications Obtained By 3d Printing**” (<https://shorturl.at/sC247>)

1. Development of 3D-Printed Gelatin Methacryloyl-Based Scaffolds with Potential Application in Tissue Engineering

For the first time in the field, a systematic study regarding the influence of methacrylation degree, concentration of polymer, and concentration of photoinitiator on 3D printing was performed, using as raw material gelatin methacrylate.

This research work is regarded as being of significant value since it offers a thorough assessment of some parameters that affect the hydrogels based on GelMA's ability to be 3D printed, as well as their mechanical, morphological, and swelling properties.

2. Assessment of Naturally Sourced Mineral Clays for the 3D Printing of Biopolymer-Based Nanocomposite Inks

The development and characterization of the new inks based on GelMA-Cloisite Na, GelMA-Cloisite 30B, GelMA-Cloisite 15A was first reported in this study. The current study is a groundbreaking investigation into the use of natural and altered clay in GelMA-based 3D printing inks.

The effect induced by the mineral clay to the GelMA matrix was studied through rheological and printing tests, showing that clay inclusion in the polymeric matrix led to higher viscosities, consequently, inducing stability during the 3D printing process. Also, 3D printed scaffolds were studied regarding the shape fidelity using a roundness analysis of open pores, and regarding morphological, mechanical, and swelling properties.

All these findings enrich the knowledge regarding the behavior of these inorganic clays in the GelMA matrix and in 3D printing process.

3. The development of 3D Printable Composite Biomaterials Based on GelMA and Hydroxyapatite Powders Doped with Cerium Ions for Bone Tissue Regeneration

The development of new nanocomposites bio-inks based on GelMA- Hydroxyapatite Powders Doped with Cerium Ions (GelMA-HC) with applications in 3D printing, were first published in this research study.



In this respect, to select the right concentration of HAP-C and GelMA that ensures scaffold biocompatibility and cell proliferations, three concentrations of HAP, and three concentrations of GelMA were explored, then the biomaterials were physically, chemically, and biologically characterized.

The obtained results showed that the porosity and osteogenic differentiation increased when a concentration of 30% GelMA and a concentration of 3% HC, were used to obtain the composite ink. Therefore, the newly scaffolds based on GelMA-HC5 that show properties and abilities for osteogenic differentiation, are appealing materials to be used in bone regeneration.

4. The development of 3D printed composite scaffolds of GelMA and hydroxyapatite nanopowders doped with Mg/Zn ions to evaluate the expression of genes and proteins of osteogenic markers

Through this research study, new approaches for the synthesis of printable composite inks with applications in bone regeneration were explored.

For the first time, a systematic study based on new 3D printing inks composed of GelMA and hydroxyapatite powders doped with zinc (HZ) and magnesium ions (HM) was performed.

The objectives of this research were to select the right concentration of HZ, HM and GelMA, which ensure printability properties of the inks, scaffolds biocompatibility, cell proliferations and osteogenic differentiations. Investigation of the morphological properties induced by different concentrations of HZ and HM on GelMA matrix, also the printability properties induced by different concentrations of GelMA-HZ and GelMA-HM, represents a pioneering study, the new information obtained making it a valuable one in the field of biomedicine.

Observing the morphological and biological results of the 3D printed scaffolds that maintained their shape fidelity and provided cell viability and osteogenic differentiation, we can state that the newly developed nanocomposites hydrogels based on 25%GelMA-3%Z3, 30% GelMA-3%Z3, 25%GelMA-3%M3, 30%GelMA-3%M3 are suitable composite materials to be used for bone regeneration purposes.

5. 3D Printing of Super Concentrated Alginate Clay Ink with potential application in Regenerative Medicine

The experimental research that enabled the creation of 3D printable inks with potential tissue engineering applications continues by investigating the printability of alginate and its combination with natural clay.

The innovation of this study refers to the development of new 3D printable ink based on alginate and Cloisite Na that allows the obtaining scaffolds with high viscosity, high shape fidelity and high resistance at temperature variations.

Also, the comparative study between the alginate-based hydrogel and the two printing inks based on alginate clay-18% Cloisite Na and alginate clay-20% Cloisite Na, represents pioneering research, providing important information about the characteristics induced to GelMA matrix by different concentrations of clays.

The newly developed ink based on alginate-20% clay, provided reproducibility of the 3D printing process. The 3D printed scaffolds showed high shape fidelity, high resistance at temperature variations, and high porosity, making alginate-20% clay ink an appropriate material for 3D printing technology, with potential application in tissue engineering.

## 6. 3D Printing of Alginate-Natural Clay Hydrogel-Based Nanocomposites

The originality of this study is provided by the development of the new 3D printable biomaterials based on alginate-Cloisite Na, alginate-Cloisite 30B, alginate-Cloisite 93A, alginate-Cloisite 20A and alginate-Cloisite 15A. This is the first comprehensive investigation into how various types of clay affect the alginate matrix to produce a hydrogel-based ink with applications in additive manufacturing.

Due to the biological results, the high shape fidelity of the 3D printed scaffolds, the mechanical properties and the reproducibility, the alginate-Cloisite Na and alginate-Cloisite 93A nanocomposites were suitable materials to be used for the design of customized scaffolds in bone regeneration.

All these new studies and formulations developed make significant contributions both in understanding the behavior of certain materials and in the design of new biomaterials adequate for 3D printing process and tissue engineering applications.

## List of publications

1. **R.L. Alexa**, H. Iovu, J. Ghitman, A. Serafim, C. Stavarache, M.M. Marin, R. Ianchis, 3D-printed gelatin methacryloyl-based scaffolds with potential application in tissue engineering, *Polymers*, 2021, 13(5), 727. (IF 4,967)
2. **R.L. Alexa**, H. Iovu, B. Trica, C. Zaharia, A. Serafim, E. Alexandrescu, I.C. Radu, G. Vlasceanu, S.Preda, C.M. Ninciuleanu, R. Ianchis, Assessment of naturally sourced mineral clays for the 3Dprinting of biopolymer-based nanocomposite inks, *Nanomaterials*, 2021, 11(3), 703. (IF 5.719)
3. **R.L. Alexa**, H. Iovu, M.C. Nicolae, I.C. Mihaescu, E. Alexandrescu, R. Ianchis, „3D printing of super concentrated alginate clay ink with potential application in regenerative medicine”, *UPB Scientific Bulletin, Series B: Chemistry and Materials*, 2021
4. **R.L. Alexa**, R. Ianchis, D. Savu, M. Temelie, B. Trica, A. Serafim, G.M. Vlasceanu, E. Alexandrescu, S.Preda, H. Iovu, &quot; 3D Printing of Alginate-Natural Clay Hydrogel-Based Nanocomposites, *Gels*, 2021, 7(4), 211. (IF 4.432)
5. **R. Leu Alexa**, A. Cucuruz, C.-D. Ghițulică, G. Voicu, L.-R. Stamat, S. Dinescu, G.M. Vlasceanu, C. Stavarache, R. Ianchis, H. Iovu, M. Costache, „3D Printable Composite Biomaterials Based on GelMA and Hydroxyapatite Powders Doped with Cerium Ions for Bone Tissue Regeneration”, *International Journal of Molecular Sciences*, 2022, 23(3), 1841. (IF 6.208)
6. **R.L. Alexa**, A. Cucuruz, C.D. Ghițulică, G. Voicu, L.R. Stamat (Balahura), S. Dinescu, G. M. Vlasceanu, H. Iovu, A. Serafim, R. Ianchis, L.T. Ciocan, M. Costache, “3D Printed Composite Scaffolds of GelMA and Hydroxyapatite Nanopowders Doped with Mg/Zn Ions to Evaluate the Expression of Genes and Proteins of Osteogenic Markers”, *Nanomaterials*, 2022, 12(19), 3420. (IF 5.719)
7. M.M. Marin, R. Ianchis, **R. Leu Alexa**, I.C. Gifu, M.G.A. Kaya, D.I. Savu, R.C. Popescu, E. Alexandrescu, C.M. Ninciuleanu, S. Preda, M. Ignat, R. Constantinescu, H. Iovu, „Development of New Collagen/Clay Composite Biomaterials”, *International Journal of Molecular Sciences*, 2022, 23 (10), 401
8. P. Stanescu, I.C. Radu, **R. Alexa**, A. Hudita, E. Tanasa, J. Ghitman, O. Stoian, A. Tsatsakis, O. Ginghina, C. Zaharia, M. Shtilman, Y. Mezhuev, B. Galateanu, (2021), “Novel chitosan and bacterial cellulose biocomposites tailored with polymeric nanoparticles for modern wound dressing development”, *Drug Delivery*. 2021, 28, 1932-1950
9. Marin, M.M.; Albu Kaya, M.; Kaya, D.A.; Constantinescu, R.; Trica, B.; Gifu, I.C.; Alexandrescu, E.; Nistor, C.L.; **Alexa, R.L.**; Ianchis, R. Novel Nanocomposite Hydrogels Based on Crosslinked Microbial Polysaccharide as Potential Bioactive Wound Dressings. *Materials* 2023, 16, 982. <https://doi.org/10.3390/ma16030982>

10. Ianchis, R.; **Alexa, R.L.\***; Gifu, I.C.; Marin, M.M.; Alexandrescu, E.; Constantinescu, R.; Serafim, A.; Nistor, C.L.; Petcu, C. Novel Green Crosslinked Salecan Hydrogels and Preliminary Investigation of Their Use in 3D Printing. *Pharmaceutics* 2023, 15, 373. <https://doi.org/10.3390/pharmaceutics15020373>

11. Marin, M.M.; Gifu, I.C.; Pircalabioru, G.G.; Albu Kaya, M.; Constantinescu, R.R.; **Alexa, R.L.**; Trica, B.; Alexandrescu, E.; Nistor, C.L.; Petcu, C.; Ianchis, R. Microbial Polysaccharide-Based Formulation with Silica Nanoparticles; A New Hydrogel Nanocomposite for 3D Printing. *Gels* 2023, 9, 425. <https://doi.org/10.3390/gels9050425>

12. Raluca Ianchis, Maria Minodora Marin\*, **Rebeca Leu Alexa\***, Ioana Catalina Gifu, Elvira Alexandrescu, Gratiela Gradisteanu Pircalabioru, George Mihail Vlasceanu, George Mihail Teodorescu, Andrada Serafim, Silviu Preda, Cristina Lavinia Nistor, and Cristian Petcu Nanoclay-reinforced alginate/salecan composite inks for 3D printing applications, *International Journal of Bioprinting*, June 2023 <https://doi.org/10.36922/ijb.0967>

<https://www.researchgate.net/profile/Rebeca-Alexa>

### **List of patent applications**

1. “Compoziție și procedeu de obținere a unor hidrogeluri pe bază de salean și de utilizare a acestora pentru manufacturare aditivă”, R. Ianchiș, R.L. Alexa, M.M. Marin, C.I. Gifu, C.M. Ninciuleanu, E. Alexandrescu, C. Scmoroscenco, S.G. Burlacu, C.I. Mihăescu, C.L. Nistor, C. Petcu, H. Iovu, A2021-00643/25.10.2021
2. Compoziții și procedeu de obținere a unor hidrogeluri compozite pe bază de polizaharide naturale și aplicarea acestora în procesul de imprimare tridimensională, R. Ianchis, M.M. Marin, R.L. Alexa, C.I. Gifu, C.M. Ninciuleanu, E. Alexandrescu, C. Scmoroscenco, S.G. Burlacu, C.I. Mihaescu, C.L. Nistor, C. Petcu, H. Iovu, A 2022-00127/16.03.2022