

FUNDING PROGRAMME: PNIII- Program 2

SUBPROGRAM: 2.1-Transfer project to the economic operator (PTE-2019)

PROJECT TITLE/ACRONYM: Algorithm for the valorization of entomological and leather residues in multivalent systems for skin tissue regeneration /BIOTEHKER

CONTRACT NO.: 5PTE_2020-2022

TOTAL PROJECT BUDGET: 1890000 lei/ 378000 euro

INCDTP'S BUDGET: 155000 lei/120000 euro

PROJECT STARTING DATA: 01/06/2020

PROJECT ENDING DATA: 01/06/2022

PAGINA WEB: : <https://256poc.biotehnos.ro/>

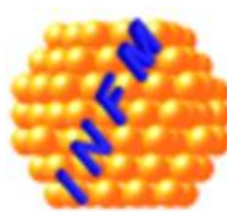
PARTNERS:

SC Biotehnos
coordonator

SA- INCDDTP-Sucursala ICPI
Partener 1

INCDDTFM
Partener 2

UPB
Partener 3



GENERAL OBJECTIVES:

Implementation of optimized biotechnologies for obtaining structural compounds with a healing effect (chitin and keratin) from entomological and leather residues and innovative multicomponent associations (vegetable extracts and bio-effective intermetallic materials), in order to create, including through 3D-printing technology, integrated delivery systems for active principles.

SPECIFIC OBJECTIVES/ EXECUTION PHASES:

- Developing the capacity for product and technology innovation, by reaching a new technological stage for a series of intermediate products and prototypes in the portfolio and completing it with new, complementary products such as cutaneous action;
- Stimulating research in the private sector through collaboration with research institutes and public universities;
- Stimulating knowledge transfer in the private sector and capitalizing on research results.

NOVELTY ELEMENTS/ SCIENTIFIC CONCEPT:

Biotechnological valorization of entomological and leather waste; combination of structural compounds / plant extracts / antimicrobial intermetallic structures; state-of-the-art topical formulations - 3D-printing for skin regeneration, with a projection into personalized medicine in Romania.

EXPECTED EXPLOITABLE RESULTS:

- Keratin-based additives for chronic wound healing;
- Keratin extraction and refining technologies for pharmaceutical use.

OBTAINED RESULTS:

- New biomaterial formulas for chronic wound healing;
- Pharmaceutical grade keratin for the formulation of creams, gels or powders.





Keratin batches obtained from sheep wool, for pharmaceutical use, porous structure

DISSEMINATION, PATENT APPLICATIONS, AWARDS:

- **WoS published papers: 1**

Olariu, L.; Dumitriu, B.G.; Gaidau, C.; Stanca, M.; Tanase, L.M.; Ene, M.D.; Stanculescu, I.-R.; Tablet, C. Bioactive Low Molecular Weight Keratin Hydrolysates for Improving Skin Wound Healing. *Polymers* **2022**, *14*, 1125. <https://doi.org/10.3390/polym14061125>, IF=4, 329 (Q1), AIS=2,037.

- **BDI published papers: 3**

► Gaidau Carmen, Rapa Maria, Olariu Laura, Dumitriu Brindusa Georgiana, Mosutiu Anamaria, Stanca Maria, Berechet Daniela, **Leather and Wool Byproducts for Bioactive Additives**, Conferinta Internationala "Innovative solutions for sustainable development of textiles and leather industry", 26-27 mai 2022, Oradea, Romania, *prezentare orala*, publicatii; Book of abstract, **P-ISSN: 1843 – 813X, CD-ISSN-2068 – 1070, E-ISSN- ISSN 2457-488, BDI** si Annals of the University of Oradea, Fascicle of Textiles, Leatherwork, vol 23, nr.1, Editura Universitatii din Oradea, **ISSN 1843 – 813X, pg.73-76**.

► Demetra Simion, Carmen Gaidau, Jianzhong Ma, Zhang Wembo, New nanostructured composite obtained by innovative technologies, *prezentare orala* la 8th International Conference on Advanced Materials and Systems, ICAMS 2020, 1-3 octombrie 2020, Bucuresti, www.icams2020.ro, DOI: [10.24264/icams-2020.II.22](https://doi.org/10.24264/icams-2020.II.22)

► Mariana Daniela Berechet, Demetra Simion, Maria Stanca, Ciprian Chelaru, Cosmin-Andrei Alexe, Maria Rapa, The influence of alkaline extraction on some keratin hydrolysates properties, care se va publica in volumul 8th International Conference on Advanced Materials and Systems, ICAMS 2020, 1-3 octombrie 2020, Bucuresti, Editura Certex, DOI: [10.24264/icams-2020.II.3](https://doi.org/10.24264/icams-2020.II.3)

- **Scientific communications: 5**

► Carmen Gaidau, Maria Stanca, Cosmin-Andrei Alexe, Daniela Berechet, Laura Olariu, Brandusa Dumitru, Veronica Drumea, The influence of enzymatic hydrolysis on keratin properties, Biocatalysis Open Days, 26 noiembrie 2020, poster prezentare virtuala, <http://www.efbiotechnology.org>

► Cosmin-Andrei Alexe, Carmen Gaidau, Maria Stanca, Daniela Berechet¹, Laura Olariu, Brandusa Dumitru, Veronica Drumea, Keratin hydrolysates used as biostimulators, EFB 2021, European Federation of Biotechnology, Virtual Conference, 10-14 May 2021, comunicare poster

► Demetra Simion, Roxana Constantinescu, Carmen Gaidau, Maria Stanca, Cosmin Alexe, Laura Olariu, Brandusa Dumitru, Study of the influence of UVC radiation on microbial load and structural modification of keratin hydrolysate powders, VI. International Leather Engineering Congress, Innovative Aspects for Leather Industry, November 25-26, 2021 Izmir/Turkey, lucrare extenso, prezentare virtuala poster si lucrare in extenso

► Maria Stanca, Carmen Gaidau, Roxana Constantinescu, Roxana Trusca, Ioana Stanculescu, Daniela Berechet, Cosmin Alexe, Cristina Enascuta, Laura Olariu, Brandusa Dumitru, Preparation and characterisation of bioactive

micro and nanokertin particles VI. International Leather Engineering Congress, Innovative Aspects for Leather Industry, November 25-26, 2021 Izmir/Turkey, lucrare extenso, prezentare virtuala poster si lucrare in extenso http://www.iafli.ege.edu.tr/wp-content/uploads/2021/11/IAFLI_2021_Congress_Programme.pdf

► C. Gaidau, M. Stanca, D. Berechet, M. Rapa, A. Mosutiu, L. Olariu, B.G. Dumitriu, **Processing** of protein byproducts for new biomaterials design, 12th International Conference on Materials Science & Engineering, Bramat 2022, Brasov, 9-11 martie 2022, **II.PO.1.**, pp.54, prezentare Poster.

- **Patent Applications: 1**

OSIM, A/00295/31.05.2022, Procedeu de obținere și asocieri inovative de compuși bioactivi în terapia rănilor cu vindecare dificilă, Laura OLARIU, Brândușa Georgiana DUMITRIU, Carmen-Cornelia GAIDĂU, Petre BĂDICĂ, Nicolae-Dan BATALU.

- **Awards: 1**

Gold medal EuroInvent, 28 mai 2022, Iasi, 14th Edition of European Exhibition of Creativity and Innovation, Porous orthotic structures functionalized with antimicrobial powders, polypeptide fragments and plant extracts used in orthopedics and traumatology, D.N Batalu, N.Dobre, I.O..Trancau, B.G.Dumitriu, L.Olariu, M.A,Grigorescu, M.Burdusel, G.V.Aldica, P.Badica, C.Gaidau.



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