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RECTORATUL

## Universitatea Babeş-Bolyai Competiția Excelenței 2010

### Dosar individual

**Notă: Toate datele se referă la perioada 2005-2009**

<b>Nume, prenume, grad did.</b>	<b>CONF. DR. ING. PAIZS CSABA</b>
<b>Facultatea, Catedra</b>	Chimie si inginerie chimica, Catedra de biochimie si inginerie biochimica
<b>Domeniul științific</b>	Biotehnologii, Ingineria si securitatea alimentelor
<b>Adresa paginii web personale</b>	<a href="http://www.chem.ubbcluj.ro/catedre/biochimie-inginerie.html">http://www.chem.ubbcluj.ro/catedre/biochimie-inginerie.html</a>
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### Criteriaul I – Output

**1. Articole științifice publicate în reviste indexate ISI (cu menționare factorului de impact în cazul celor cotate)**

Titlu	Autori	Revista	Factor impact
NIR surface enhanced Raman spectroscopy and bands assignment by DFT calculations of non-natural $\beta$ -amino acids	Iliescu, T., Maniu, D., Chiș, V., Irimie, F. D., Paizs, Cs., Toșa, M.	Chemical Physics <b>2005</b> , 310, 189-199.	1.961
Inhibition of Histidine Ammonia-Lyase by Heteroaryl-alanines and Acrylates.	Katona, A., Toșa, M. I., Paizs, Cs., Rétey, J	Chemistry and Biodiversity <b>2006</b> , 3, 502-508.	1.659
The interaction of heteroaryl-acrylates and alanines with phenylalanine ammonia-lyase from parsley	Paizs, C., Katona, A., Rétey, J.	<i>Chemistry - A European Journal</i> <b>2006</b> , 12 (10), pp. 2739-2744	5.454
Chemoenzymatic one-pot synthesis of enantiopure L-arylanines from arylaldehydes	Paizs, C., Katona, A., Rétey, J.	<i>European Journal of Organic Chemistry</i> <b>2006</b> , (5), pp. 1113-1116	3.016
Mechanistic aspects and biocatalytic implications of the mio-containing ammonia-lyase / aminomutase family	László Poppe, Sarolta Pilbák, Csaba Paizs, János Rétey	<i>Studia Univ. "Babeş-Bolyai", Chemia</i> , <b>2008</b> , 53(4/2), 15-18	0
Investigation of the mechanism of action of pyrogallol-phloroglucinol transhydroxylase by using putative intermediates.	Paizs, C., Bartlewski-Hof, U., Rétey, J.	<i>Chemistry - A European Journal</i> <b>2007</b> , 13 (10), pp. 2805-2811	3.016
Chemoenzymatic preparation of enantiopure L-benzofuranyl- and L-benzo[b]thiophenyl alanines	Podea, P., Toșa, M. I., Paizs, Cs., Irimie, F. D.	<i>Tetrahedron: Asymmetry</i> <b>2008</b> , 19, 500-511.	2.796
Lipase-catalyzed kinetic resolution of racemic 1-heteroarylethanol—experimental and QM/MM study	Toșa, M. I., Pilbák, S., Moldovan, P., Paizs, Cs., Szatzker, G., Szakács, Gy., Novák, L., Irimie, F. D.,	<i>Tetrahedron: Asymmetry</i> <b>2008</b> , 19, 1844-1852.	2.796

Chemoenzymatic synthesis of (R)- and (S)-1-heteroarylethanol.	Poppe, L. Toşa, M. I., Podea, P., Paizs, Cs., Irimie, F. D	Tetrahedron: Asymmetry <b>2008</b> , 19, 2068-2071.	2.796
Baker's yeast-mediated synthesis of (R)- and (S)-heteroaryl-ethane-1,2-diols	Podea, P., Paizs, Cs., Toşa, M. I., Irimie, F.	Tetrahedron: Asymmetry <b>2008</b> , 19, 1959-1964.	2.796
The putative coenzyme B12-dependent methylmalonyl-CoA mutase from potatoes is a phosphatase	Paizs, C., Diemer, T., Rétey, J.	<i>Bioorganic Chemistry</i> 2008, 36 (6), pp. 261-264	1.958
Enzyme-catalyzed synthesis of (R)- and (S)-3-heteroaryl-3-hydroxy-propanoic acids and their derivatives.	Brem J., Paizs Cs., Toşa M. I., Vass E., Irimie F. D	Tetrahedron: Asymmetry <b>2009</b> , 20, 489-496.	2.796
New ways for old structures	Irimie, F.D., Paizs, C., Tosa, M., Podea, P.	<i>Studia Universitatis Babes-Bolyai Chemia</i> <b>2009</b> , 4 (1), 7-16	0
The effect of electromagnetic fields on baker's yeast population dynamics, biocatalytic activity and selectivity	Sandu, D., Lingvay, I., Lányi, S., Micu, D.D., Popescu, C.L., Brem, J., Bencze, L.C., Paizs, C.	<i>Studia Universitatis Babes-Bolyai Chemia</i> 2009, 4 (2), pp. 195-201	0

## 6. Cărți științifice publicate în edituri naționale acreditate

1. Toşa Monica-Ioana, Paizs Csaba, Irimie Florin-Dan, *Bioprocese pentru obținerea medicamentelor și intermediarilor*. Editura Napoca Star, Cluj-Napoca 2007, ISBN 978-973-647-531-5, 215 pag
2. Irimie Florin Dan, Paizs Csaba, Toşa Monica *Biotransformări în sinteza organică. Aspecte Fundamentale*. Editura Napoca Star, Cluj-Napoca 2006, ISBN 978-973-647-467-5, 180 pag
3. Moldovan Paula, Toşa Monica Ioana, Leţ Daniela, Majdik Cornelia, Paizs Csaba, Irimie Florin Dan *Aplicații pentru laboratorul de biochimie* Editura Napoca Star, Cluj Napoca 2006, ISBN 978-973-647-464-4, 153 pag.

## Criteriaul II – Prestigiu profesional

### 1. Citări ale articolelor ISI listate la Criteriaul I

Enzyme-catalyzed synthesis of (R)- and (S)-3-heteroaryl-3-hydroxy-propanoic acids and their derivatives, *Tetrahedron Asymmetry* 2009, 20 (4), pp. 489-496

1. Synthesis of a core carbon framework of cyanosporasides A and B, Aburano, D., Inagaki, F., Tomonaga, S., Mukai, C., *Journal of Organic Chemistry* 2009, 74 (15), pp. 5590-5594

Chemoenzymatic synthesis of (R)- and (S)-1-heteroarylethanol, *Tetrahedron Asymmetry* 2008, 19 (17), pp. 2068-2071

1. Chiral spiroaminoborate ester as a highly enantioselective and efficient catalyst for the borane reduction of furyl, thiophene, chroman, and thiochroman-containing ketones, Stepanenko, V., De Jesús, M., Correa, W., Bermúdez, L., Vázquez, C., Guzmán, I., Ortiz-Marciales, M. *Tetrahedron Asymmetry* 2009, 20 (23), pp. 2659-2665
2. Stereoselective chemoenzymatic synthesis of enantiopure 1-(Heteroaryl)ethanamines by lipase-Catalysed kinetic resolutions, Alatorre-Santamaria, S., Gotor-Fernandez, V., Gotor, V. *European Journal of Organic Chemistry* 2009, (15), pp. 2533-2538

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2. Enantioselective Rh-catalyzed transfer hydrogenation of  $\alpha$ -sulfonyloxy heteroaryl ketones; asymmetric synthesis of (S)-bufuralol, Kwak, S.H., Lee, D.-M., Lee, K.-I. *Tetrahedron Asymmetry* 2009, 20 (22), pp. 2639-2645

Lipase-catalyzed kinetic resolution of racemic 1-heteroarylethanol-experimental and QM/MM study, *Tetrahedron Asymmetry* 2008, 19 (15), pp. 1844-1852

1. Chiral spiroaminoborate ester as a highly enantioselective and efficient catalyst for the borane reduction of furyl, thiophene, chroman, and thiochroman-containing ketones, Stepanenko, V., De Jesús, M., Correa, W., Bermúdez, L., Vázquez, C., Guzmán, I., Ortiz-Marciales, M. *Tetrahedron Asymmetry* 2009, 20 (23), pp. 2659-2665

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  - New ways for old structures , Irimie, F.D., Paizs, C., Tosa, M., Podea, P. *Studia Universitatis Babes-Bolyai Chemia* 2009, 4 (1), pp. 7-16
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  - Chemoenzymatic synthesis of (R)- and (S)-1-heteroarylethanol, Toşa, M.I., Podea, P.V., Paizs, C., Irimie, F.D. *Tetrahedron Asymmetry* 2008, 19 (17), pp. 2068-2071
- Chemoenzymatic preparation of enantiopure l-benzofuranyl- and l-benzo[b]thiophenyl alanines *Tetrahedron Asymmetry* 2008, 19 (4), pp. 500-511
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- Structure and chemistry of 4-methylideneimidazole-5-one containing enzymes , Cooke, H.A., Christianson, C.V., Bruner, S.D. *Current Opinion in Chemical Biology* 2009, 13 (4), pp. 453-461
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  - Discovery of a Substrate Selectivity Switch in Tyrosine Ammonia-Lyase, a Member of the Aromatic Amino Acid Lyase Family , Watts, K.T., Mijts, B.N., Lee, P.C., Manning, A.J., Schmidt-Dannert, C. *Chemistry and Biology* 2006, 13 (12), pp. 1317-1326
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- Chemo-enzymatic cascade oxidation in supercritical carbon dioxide/water biphasic media, Karmee, S.K., Roosen, C., Kohlmann, C., Lütz, S., Greiner, L., Leitner, W., *Green Chemistry* 2009, 11 (7), pp. 1052-1055
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  - New advances in the asymmetric synthesis of  $\alpha$ -amino acids , Lin, J., Fan, H.-D., Yan, S.-J. *Chinese Journal of Organic Chemistry* 2007, 27 (8), pp. 925-936
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  - Discovery of a Substrate Selectivity Switch in Tyrosine Ammonia-Lyase, a Member of the Aromatic Amino Acid Lyase Family , Watts, K.T., Mijts, B.N., Lee, P.C., Manning, A.J., Schmidt-Dannert, C. Watts,

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2. Dopamine molecules on Au@Ag shell bimetallic nanocolloids: Fourier transform infrared, raman, and surface-enhanced Raman spectroscopy study aided by density functional theory, Pande, S., Jana, S., Sinha, A.K., Sarkar, S., Basu, M., Pradhan, M., Pal, A., (...), Pal, T. *Journal of Physical Chemistry C* 2009, 113 (17), pp. 6989-7002
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4. Raman and surface enhanced Raman spectroscopy on molecules of pharmaceutical and biological interest, Iliescu, T., Baia, M., Maniu, D. *Romanian Reports on Physics* 2008, 60 (3), pp. 829-855
5. Surface-enhanced Raman scattering and DFT computational studies of a benzotriazole derivative, Li, M.-Y., Liao, Q., Zhang, M., Ai, X.-C., Li, F.-Y. *Journal of Molecular Structure* 2008, 888 (1-3), pp. 2-6
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7. Concentration-dependent orientational changes of 2-amino-2-thiazoline molecule adsorbed on silver nanocolloidal surface investigated by SERS and DFT, Chowdhury, J., Sarkar, J., Tanaka, T., Talapatra, G.B. *Journal of Physical Chemistry C* 2008, 112 (1), pp. 227-239
8. Surface-enhanced Raman scattering and DFT computational studies of a cyanuric chloride derivative, Liao, Q., Li, M.-Y., Hao, R., Ai, X.-C., Zhang, J.-P., Wang, Y. *Vibrational Spectroscopy* 2007, 44 (2), pp. 351-356
9. Adsorption of 2-amino-6-methylbenzothiazole on colloidal silver particles: Quantum chemical calculations and surface enhanced Raman scattering study, Chowdhury, J., Sarkar, J., De, R., Ghosh, M., Talapatra, G.B. *Chemical Physics* 2006, 330 (1-2), pp. 172-183
10. Electromagnetic mechanism of SERS, Schatz, G.C., Young, M.A., Van Duyne, R.P. *Topics in Applied Physics* 2006, 103, pp. 19-46
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2. New ways for old structures, Irimie, F.D., Paizs, C., Tosa, M., Podea, P. *Studia Universitatis Babeş-Bolyai Chemia* 2009, 4 (1), pp. 7-16
3. Chemoenzymatic method to enantiopure Sulphur heterocyclic  $\beta$ -hydroxy nitriles, Turcu, M.C., Perkiö, P., Kanerva, L.T. *Arkivoc* 2009 (3), pp. 251-263
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5. Chemoenzymatic and microbial dynamic kinetic resolutions, Kamaruddin, A.H., Uzir, M.H., Aboul-Enein, H.Y., Halim, H.N.A. *Chirality* 2009, 21 (4), pp. 449-467
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7. Recent developments in dynamic kinetic resolution, Pellissier, H. *Tetrahedron* 2008, 64 (8), pp. 1563-1601
8. Enantiomers of amino ethanols and their precursors by lipase catalysis in non-aqueous solvents, Lundell, K., Kanerva, L.T. *Chimica Oggi* 2007, 25 (5 SUPPL. 2), pp. 26-30
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15. Enantioselective C-C bond synthesis catalysed by enzymes, Sukumaran, J., Hanefeld, U. *Chemical Society Reviews* 2005, 34 (6), pp. 530-542
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9. Lipase-catalyzed deacylation by alcoholysis: A selective, useful transesterification reaction, Santaniello, E., Casati, S., Ciuffreda, P. *Current Organic Chemistry* 2006, 10 (10), pp. 1095-1123
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12. Application of lipases in kinetic resolution of racemates, Ghanem, A., Aboul-Enein, H.Y. *Chirality* 2005, 17 (1), pp. 1-15
13. Lipase-mediated chiral resolution of racemates in organic solvents, Ghanem, A., Aboul-Enein, H.Y. *Tetrahedron Asymmetry* 2004, 15 (21), pp. 3331-3351
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#### 10. Participări la programe/granturi finanțate din sursă națională (se menționează și valoarea)

Nr.	Titlu	Funcție
1	<i>Metoda noua de separare a compusilor enantiopuri utilizand anticorpi selectivi (2004-2006), Contract CERES 532/2004</i>	membru 2003-2005
2	<i>Metodologie biocatalitica de obtinere selectiva a unor sintoni chirali pentru sinteza de compusi cu activitate biologica (2003-2005), Contract Ceres 189/2003</i>	Responsabil UBB 2003-2005
3	<i>Model experimental bioreactor-extractor pentru obtinerea enzimatica a unor compusi anti-sida (2003-2005), Contract Ceres 1990/2003</i>	Responsabil UBB 2003-2005
4	<i>Tehnologie de transesterificare enzimatica destinata obtinerii de biocarburanti de generatia a 2-a PNCD II</i>	membru 2008-2010
5	<i>Sinteza enzimatică a unor amino- și hidroxiacizi heterociclici nenaturali.</i>	director 2006-2008
6	<i>Investigarea mecanismului de actiune al histidin- si fenilalanin-amoniac liazelor, CNCSIS Idei II</i>	director 2009-2011

#### 15. Conferințe invitate internaționale

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6. Florin Dan Irimie, Csaba Paizs, Monica Toşa, Paula Podea, Enzyme dynamic kinetic resolution, as a valuable tool for enantiopure compounds synthesis. process and monitoring, International Symposium and Summer School „*Development of Bioanalytical Methods and Actual Applications*”, Nitra 2008, Slovacia

### III. Realizare remarcabilă

Fenilalanin amoniac liaza din pătrunjel produsă de un mutant de *E. coli* care poate media sinteza multor analogi de L-fenilalanină din acrilatii corespunzători prin adiția amoniacului. Această enzimă a fost folosită prima dată de către noi pentru sinteza D-fenilalaninelor plecând de la racematul amoniacizilor (reacție enantiomer selectivă) (**Paizs, Cs., Katona, A., Rétey, J. (2006) The Interaction of Heteroaryl-Acrylates and Alanines with Phenylalanine Ammonia-Lyase from Parsley. Chemistry, a European Journal** 12, 2739-2744.).

Abilitățile greu de egalat ale biocatalizatorilor în raport cu chemocatalizatorii constau în activitatea, selectivitatea și condițiile de lucru compatibile cu viața. Prin combinarea reacțiilor chimice (reacția Wittig) și biocatalitice (liza esterilor cu PLE urmată de adiția amoniacului mediată de fenilalanin amoniac liazei, PAL) s-a reușit sinteza diversilor analogi de L-fenilalanină într-o manieră “one-pot” plecând de la aldehydele corespunzătoare. Este prima și, pentru moment, unica metodă de sinteză “one-pot” pentru obținerea aminoacizilor enantiopuri (**Paizs, Cs., Katona, A., Rétey, J. (2006) Chemoenzymatic One-Pot Synthesis of Enantio-Pure L-Arylalanines From Arylaldehydes. European Journal of Organic Chemistry** 1113-1116.).

Data:  
18 martie 2010

**Certific validitatea datelor prezentate**  
Sef de catedră,

Semnătura: