

# *Curriculum vitae*

## **Dr. Cristina Purcarea**



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### **PROFIL**

Biochimist specializat in biochimia proteinelor, cu expertiza in enzimologie, microbiologie, biologie moleculara si celulara, cristalografie de raze X.

**SPECIALIZARE:** (1) Studiul relatiei structura-functie a enzimelor provenind din eubacterii si archaea hipertermofile si barofile privind evolutia si mecanismele de adaptare la temperaturi si presiuni ridicate. (2) Aplicatii biotehnologice si medicale ale extremozimelor.

### **STUDII**

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| 1991-1995 | Doctorat in enzimologie (Echivalare in Romania : Biologie), Universitea Paris XI, Paris, Franta                 |
| 1990-1991 | Masters (Diplome d'Etude Approfondie) in enzimologie, Universitatea Paris XI, Paris, Franta                     |
| 1983-1988 | Licenta in biologie, specialitatea biochimie, Institutul politehnic Bucuresti, Facultatea de biochimie, Romania |

### **EXPERIENTA PROFESIONALA**

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| 2007- prezent | Cercetator stiintific gradul I, Institutul de biologie, Bucuresti, Romania   |
| 2005-2007     | Cercetator stiintific gradul III, Institutul de biologie si patologii celulare "N. Simionescu", Bucuresti, Romania |
| 2003-2005     | Cercetator asociat, Universitatea Wayne State, Detroit, MI, USA  |
| 2001-2002     | Sef de proiect, Product Manager, Avidis S.A., Clermont-Ferrand, Franta   |
| 1997-2001     | Cercetator asociat, Wayne State University, Detroit, MI, USA   |
| 1995-1996     | Cercetator, Postdoctorat, Universitatea Vrije, Bruxelles, Belgia   |
| 1990-1993     | Biochimist, Institutul de biochimie, Bucuresti, Romania  |
| 1988-1990     | Biolog, Combinatul petrochimic Brazi, Romania  |

### **DOMENII DE COMPETENTA**

**Biochimie si biofizica:** – purificarea proteinor native si rocombinante, stabilizare, cristalizarea si replierea proteinelor, masuratori ale activitati enzimaticice si ale parametrilor cinetici, reactii cinetice partiale si totale, reactii cuplate, studiul reglariei allostericice si a interactiilor cooperative, masuratori enzimaticice folosind izotopi radioactivi. Studii ale influenta temperaturii si presiunii hidrostatice asupra stabilitatii si activitatii enzimaticice in reactorul de presiune ridicata, spectroscopie optica si de fluorescenta, spectrometrie de dicroism circular, cromatografie de proteine, FPLC, HPLC, ELISA, tehnici de electroforeza, western blot, refolding.

**Biologie moleculara:** constructia de banca de gene plasmidice si de bacteriofagi, extractie de AND si ARN, tehnici de clonare, mutageneza, PCR, reverse-PCR, touch-down PCR, hibridizare, secventializare de ADN, modelare moleculara si analiza de secventa, expresia de proteine in bacterii, levuri si celule de mamifere

**Cristalografie de raze X:** cristalizare de proteine, colectare de date cristalografice.

**Biologie celulara:** manipularea culturilor celulare, transfectii, microscopie optica si de fluorescenta.

**Microbiologie:** Cultivare aeroba si anaeroba a bacteriilor si archaeobacteriilor mezofile si termofile, identificarea organismelor prin secventializare si analiza de RNA ribozomal, fermentare.

**Programe de informatica:** MS Office, Word, PowerPoint, Canvas, ClarisDraw, KaleidaGraph, Corel Photo-Paint, Adobe Acrobat, HP DeskScan, GCG, Fasta, Entrez, Medline, Swiss Model, Rasmol, Quanta, PDBViewer, Hydrophobic Cluster Analysis (HCA), EndNote, Unix.

**Limbi straine:** engleza si franceza

## **PUBLICATII**

### *TEZA DE DOCTORAT*

*"Studiul enzimelor implicate in metabolismul carbamoilfosfatului la archaeonul marin hipertermofil si barofil Pyrococcus abyssi", Universitatea Paris-Sud, 1995(4 citari)*

### *CARTI*

1. **Autor** Purcarea C (2009) Adaptari moleculare la temperaturi inalte. Vol. Adaptarea la stres: conditie de supravietuire si/sau factor de biodiversitate. Ed. Acad. Romane. p 43-50
2. **Autor** Purcarea, C. (2001) capitol *Aspartate transcarbamoylase from Pyrococcus abyssi*, autor Cristina Purcarea, volumul Hyperthermophilic Enzymes in *Methods in Enzymology* (Ed. M.W.W. Adams and R.M. Kelly), Acad. Press, San Diego, CA, U.S.A., vol 331, p 248-270 (**4 citari**)
3. **Coordonator stiintific** *Introduction a l'analyse genetique*, traducerea editiei a 6-a americane a volumului *An introduction to Genetic Analysis*, autori Griffiths, Miller, Suzuki, Lewontin and Gelbert. Bruxelles, DeBoeck Universite, 1997 - XVIII-918 p.

## **ARTICOLE**

### Publicate ISI

1. E. Popa, A. Rusu, M. Zamfir, L. Dumitru, **C. Purcarea** (2009) An ammonia-metabolizing enzyme from the human archaeon *Methanobrevibacter smithii* might represent a missing link in the evolution of carbamoyl phosphate synthetases. *Biotechnology and Biotechnological Equipment*, vol. 23(2): 533-537.
2. Zhang P, Martin PD, **Purcarea C**, Vaishnav A, Brunzelle JS, Fernando R, Guy-Evans HI, Evans DR, Edwards BF (2009) Dihydroorotase from the hyperthermophile *Aquifex aeolicus* is activated by stoichiometric association with aspartate transcarbamoylase and forms a one-pot reactor for pyrimidine biosynthesis. *Biochemistry*. 48: 766-78
3. **Purcarea, C.** Roshini, F., Guy, HI, Evans DR. The Sole Serine/threonine Protein Kinase and its Cognate Phosphatase from *Aquifex aeolicus* Targets Pyrimidine Biosynthesis. (2008) *Mol Cell Biochem*. 311:199-213
4. Martin, P., **Purcarea, C.**, Vickrey, J.F., Evans, D.R., Guy, H.I., Edwards, B.F.P. The crystal structure of a novel, one-zinc dihydroorotase from *Aquifex aeolicus*. (2005) *J Mol Biol*. 348:535-47.
5. Kothe, M., **Purcarea, C.**, Guy, H., Evans, D.R., Powers-Lee, S. (2005) Direct Demonstration of Carbamoyl Phosphate Formation on the C-terminal Domain of Carbamoyl Phosphate Synthetase. *Protein Sci*. 14, 37-44
6. Ahuja, A, **Purcarea, C**, Ebert, R, Guy, HI, Evans, DR (2004) *Aquifex aeolicus* dihydroorotase: association with aspartate transcarbamoylase switches on catalytic activity. *J Biol Chem*. 279, 53136-53144
7. **Purcarea, C.**, Lu, T., Ahuja, A., Kovari L., D.R. Evans. (2003) *Aquifex aeolicus* aspartate transcarbamoylase: an enzyme specialized for the efficient utilization of unstable carbamoyl phosphate at elevated temperature. *J. Biol. Chem*. 27, 52924-52934.
8. **Purcarea, C.**, Martin, P., Vickrey, J.F., Guy, H.I., Edwards, B.F.P., Evans, D.R. (2002) Cloning, Expression and Preliminary X-ray Analysis of the Dihydroorotase from the Hyperthermophilic Eubacterium *Aquifex aeolicus*. *Acta Crystallographica Section D Biological Crystallography* 58, 154-156

9. Ahuja, A., **Purcarea, C.**, Guy, H.I., Evans, D.R. (2001) A novel carbamoyl phosphate synthetase from *Aquifex aeolicus*. *J. Biol. Chem.* 276:45694-45703.
10. **Purcarea, C.**, Herve, G., Cunin, R., Evans, D.R. (2001) Cloning, expression and structure analysis of carbamate kinase-like carbamoyl phosphate synthetase from *Pyrococcus abyssi*. *Extremophiles*. 5:229-239.
11. Simon, V., **Purcarea, C.**, Sun, K., Joseph, J., Frebourg, G., Lechaire, J.-P., Gaill, F., Herve, G. (2000) The enzymes involved in synthesis and utilization of carbamylphosphate in the deep-sea tube worm *Riftia pachyptila*. *Marine Biology*, 136:115-127.
12. Watrin, L., Lucas, S., **Purcarea, C.**, Legrain, C., Cunin, R., Prieur, D. (1999) Isolation and characterization of pyrimidine auxotrophs and molecular cloning of the *pyrE* gene from the hyperthermophilic archaeon *Pyrococcus abyssi*. *Mol. Gen. Genet.* 262:378-381.
13. **Purcarea, C.**, Evans, D.R., Herve, G. (1999) Channeling of carbamoyl phosphate to the pyrimidine and arginine biosynthetic pathways in the deep-sea hyperthermophilic archaeon *Pyrococcus abyssi*. *J. Biol. Chem.* 274: 6122-6129.
14. Labedan, B., Boyen, A., Baetens, M., Charlier, D., Chen, P., Cunin, R., Durbecq, V., Glansdorff, N., Herve, G., Legrain, C., Liang, Z., **Purcarea, C.**, Roovers, M., Sanchez, R., Toong, T.L., Van de Castele, M., Van Vliet, F., Xu, Y., Zhang, Y-F. (1999) The evolutionary history of carbamoyltransferases: a complex set of paralogous genes was already present in the last universal common ancestor. *J. Mol. Evol.*, 49: 461-473.
15. **Purcarea, C.**, Herve, G., Ladjimi, M.M., Cunin, R. (1997) Aspartate transcarbamylase from the deep-sea hyperthermophilic archaeum *Pyrococcus abyssi*; genetic organization, structure and expression in *Escherichia coli*. *J. Bacteriol.* 179:4143-4157.
16. **Purcarea, C.**, Simon, V., Prieur D., Herve, G. (1996) Purification and characterization of carbamylphosphate synthetase from the deep-sea hyperthermophilic archaeobacterium *Pyrococcus abyssi*. *Eur. J. Biochem.* 236:189-199.
17. **Purcarea, C.**, Erauso, G., Prieur, D., Herve, G. (1994) The catalytic and regulatory properties of aspartate transcarbamoylase from *Pyrococcus abyssi*, a new deep-sea hyperthermophilic archaeobacterium. *Microbiology*. 140:1967-1975.
18. Sahini, V.E., **Pop, C.**, (1989) A molecular orbital approach to some radiogenetic mechanisms. *Revue Roumaine de Chimie*. 34(1): 253-257.

#### **Publicate alte baze de date**

1. **Purcarea, C.**, Herve, G., Ladjimi, M.M., Cunin, R. (1997) Aspartate transcarbamylase from the hyperthermophilic deep-sea archaeum *Pyrococcus abyssi* I. Cloning, functional and structural analysis. *Arch Physiol Biochim*, 104:B58
2. **Purcarea, C.**, Herve, G., Cunin, R. (1997) Aspartate transcarbamylase from the hyperthermophilic deep-sea archaeum *Pyrococcus abyssi* II. Expression in the mesophilic eubacterial host *Escherichia coli*. *Arch Physiol Biochim*, 104:B59
3. **Purcarea, C.**, Herve, G., Cunin, R. (1996) Aspartate transcarbamylase from a deep sea hyperthermophilic archaea (*Pyrococcus abyssi*). *FASEB J*, 10:A123.

**CITATII:** Articolele ISI au fost citate in **208 de articole** (conform Google Scholar).

#### **Secvente genice si coordonate cristalografice**

1. *Pyrococcus abyssi* aspartate transcarbamylase catalytic chain (*pyrB*) and aspartate transcarbamylase regulatory chain (*pyrI*) genes. **C. Purcarea**, G. Herve, R. Cunin (ACC# U61765)
2. *Pyrococcus abyssi* carbamate kinase-like carbamoyl phosphate synthetase (*cpkA*) gene. **C. Purcarea**, G. Herve, R. Cunin, D.R. Evans (ACC# AF081680)
3. Chain A, The crystal structure of a novel, latent dihydroorotase from *Aquifex aeolicus* at 1.7 Å resolution. Martin PD, **Purcarea C**, Zhang P, Vaishnav A, Sadecki S, Guy HI, Evans DR, Edwards BF (ACC# 1XRT\_A)
4. Chain B, The crystal structure of a novel, latent dihydroorotase from *Aquifex aeolicus* at 1.7 Å resolution. Martin PD, **Purcarea C**, Zhang P, Vaishnav A, Sadecki S, Guy HI, Evans DR, Edwards BF (ACC# 1XRT\_B)
5. Orotate phosphoribosyltransferase [*Pyrococcus abyssi*]. Watrin L, Lucas S, **Purcarea C**, Legrain C, Cunin R, Prieur D (ACC# AAD47891)

6. Ornithine carbamoyltransferase [*Pyrococcus abyssi*]. Cunin R, Seumois G, **Purcarea C**, Van Vliet F, Legrain C (ACC# AAD09004)

#### PREZENTARI STIINTIFICE LA CONFERINTE INTERNATIONALE

**Conferentiar invitata** Rutgers University, Cook College, Dept. of Biochemistry & Microbiology, New Brunswick, NJ, USA. March 9, 2001. **Seminar prezentat:** Unusual enzymes of carbamoyl phosphate metabolism from hyperthermophilic and deep-sea organisms.

1. **FEMS 2009 3<sup>rd</sup> Congress of European Microbiologists**, Gothenburg - Suedia, 28 iunie – 2 iulie 2009. Carbamoyl phosphate synthetase from the human gut archaeon *Methanobrevibacter smithii*, a putative target for obesity prevention. E. Popa, A. Rusu, C. Purcarea. *Poster*.
2. **XI Anniversary Scientific Conference "Biology-Traditions and Challenges"**, Sofia – Bulgaria, 27-29 mai, 2009. An ammonium metabolizing enzyme from the human archaeon *Methanobrevibacter smithii* might represent a missing link in the evolution of carbamoyl phosphate synthetases. E. Popa, A. Rusu, C. Purcarea. *Poster*.
3. **International Exploratory Workshop "Extremophilic microorganisms: molecular adaptations and bionotechnological applications"**, Bucuresti, 18-19 septembrie 2008. Carbamoyl phosphate synthesis in hyperthermophiles. C. Purcarea. *Prezentare orală*
4. **SNBC XXVI Annual Meeting**, Cluj-Napoca, 12-15 Iunie, 2008. Extremozime microbiene cu aplicatii medicale. C. Purcarea, S. Sadecki, DR Evans, HI Guy. *Prezentare Orală*; Arginin dezaminaza din archaeonul termocidofil *Picrophilus torridus*: un potential agent terapeutic antitumoral cu stabilitate ridicata. E. Popa, L. Dumitru, C. Purcarea. *Poster*.
5. **2<sup>nd</sup> International Symposium of Polar Scientific Research**, Bucuresti – Romania, 16-17 Noiembrie 2007. Temperature adapted microbial enzymes. C. Purcarea. *Prezentare orală*.
6. **Conferinta Internationala de Chimie-Fizica „ROMPHYSHEM-12”**, Bucuresti – Romania, 6-8 Septembrie 2006. (1) On the entropy of fast and slow refolding. C. Purcarea, C. Pantazica . V.E. Sahini. *Prezentare orală*. (2) Correlation of bacterial growth kinetics with protein refolding from culture medium G. Rusu, C. Purcarea, C. Pantazica, V.E. Sahini: *Prezentare orală*.
7. **20<sup>th</sup> International Conference on Arginine and Pyrimidines**, Lund, Sweden, 17-20 August 2006. A eukaryotic-like protein kinase and its cognate phosphatase regulates carbamoyl phosphate synthetase in the ancient hyperthermophile, *Aquifex aeolicus*. Cristina Purcarea, Hedeel Guy-Evans, and David R. Evans. *Prezentare orală H. Guy-Evans*.
8. **Aspartate Transcarbamylase International Workshop**. Brussels, Belgium. June 11-12, 2004. Posttranslational modifications of *Aquifex aeolicus* carbamoyl phosphate synthetase; phosphorylation by endogenous Ser/Thr protein kinase. C. Purcarea, H.I. Guy, D.R. Evans. *Poster*.
9. **Aspartate Transcarbamylase International Workshop**. Boston, MA, U.S.A. June 9-10, 2003. Reconstitution of eukaryotic CAD from bacterial enzymes. . C. Purcarea, D. Ebert, H.I. Guy, D.R. Evans *Prezentare Orală*.
10. **International Congress "Extremophiles 2000"**, Hamburg, Germany. September 3-7, 2000. Aspartate Transcarbamylase from the Hyperthermophilic Eubacterium *Aquifex aeolicus*. C. Purcarea, B. Fan, M. Liu, D. R. Evans. *Poster*.
11. **International Symposium on Aspartate Transcarbamylase**, Detroit, MI, U.S.A. July 13-14, 2000. Hybrid formation of a C-class aspartate transcarbamylase. . C. Purcarea, A. Ahuja, H.I. Guy, D.R. Evans. *Prezentare Orală*.
12. **International Symposium on Aspartate Transcarbamylase**, Brussels, Belgium, June 7-8, 1999. Evolution of allosteric regulation in aspartate transcarbamylases. . C. Purcarea, H.I. Guy, D.R. Evans. *Prezentare Orală*.
13. **ASBMB '99 Meeting**, San Francisco, CA, U.S.A. May 16-20, 1999. (1) *Pyrococcus abyssi* carbamate-kinase-like carbamoyl phosphate synthetase; C. Purcarea, G. Herve, R. Cunin, D. R. Evans. *Poster*; (2) Unusual pyrimidine biosynthetic enzymes from an early divergent hyperthermophilic eubacterium; C. Purcarea, B. Fan, M. Liu, J. F. Vickrey, D. R. Evans. *Poster*.
14. **Purine and Pyrimidine Metabolism in Man International Conference**, Gmunden, Autriche, June 1-7, 1997. Synthesis and utilization of carbamoyl phosphate in the pyrimidine biosynthesis in *Pyrococcus abyssi*. C. Purcarea, G. Herve, R. Cunin. *Poster*.

15. **Thermophiles '96 International Conference on the Biology, Ecology, and Biotechnology of Thermophilic Microorganisms**, Athens, GA, U.S.A. September 4-9, 1996. (1) Carbamylphosphate synthetase from *Pyrococcus abyssi*: kinetic properties and channeling of carbamylphosphate towards the arginine and pyrimidine biosynthetic pathway; C. Purcarea, V. Simon, D. Prieur, G. Herve; *Poster* (2) Cloning and expression in *Escherichia coli* of the aspartate transcarbamylase from a hyperthermophilic and barophilic archaeobacterium, *Pyrococcus abyssi*; C. Purcarea, G. Herve, M. Ladjimi and R. Cunin. *Poster*.
16. **ASBMB '96 Meeting**, New Orleans, LA, U.S.A. June 2-6, 1996. Cloning and expression of the aspartate transcarbamylase gene of the deep-sea hyperthermophilic archaeobacterium *Pyrococcus abyssi* in *Escherichia coli*; C. Purcarea, G. Herve, R. Cunin. *Poster*.
17. **International Symposium on Aspartate Transcarbamylase**, College Station, TX, U.S.A. May 30-31, 1996. Aspartate transcarbamylase from *Pyrococcus abyssi*. C. Purcarea, G. Herve, R. Cunin. *Prezentare Orala*.
18. **French Conference of the 'Bactocéan' Research Group**, "Molecular Biology of Thermophiles", Gif-sur Yvette, France, February 5-7, 1996. Structure and expression of *Pyrococcus abyssi* aspartate transcarbamylase in *Escherichia coli*. C. Purcarea, V. Simon, D. Prieur, G. Herve. *Prezentare Orala*.
19. **'Dorsales' French Conference**, "Adaptations to hydrothermal environmental constraints", Banyuls-sur-Mer, December 12-15, 1995. (1) Structural and functional properties of the *Pyrococcus abyssi* aspartate transcarbamylase. C. Purcarea, V. Simon, G. Herve. *Prezentare Orala*; (2) *Pyrococcus abyssi* carbamylphosphate synthetase: kinetic properties and carbamylphosphate channelling to both arginine and pyrimidines pathways; C. Purcarea, V. Simon, G. Herve. *Poster*.
20. **16<sup>th</sup> International Congress of Biochemistry and Molecular Biology**, New Delhi, India. September 19-22, 1994. Enzymes implicated in the synthesis and utilization of carbamylphosphate from *Pyrococcus abyssi*. C. Purcarea, G. Herve. *Poster*.
21. **14<sup>th</sup> International Arginine Workshop**, Paris, France, September 12-14, 1994. (1) Enzymatic equipment implicated in the biosynthesis and utilization of carbamylphosphate in *Pyrococcus abyssi*, C. Purcarea, G. Herve. *Prezentare Orala*; (2) Carbamylphosphate synthetase from *Pyrococcus abyssi*, a deep-sea hyperthermophilic archaeobacterium; C. Purcarea, G. Herve. *Poster*.
22. **94<sup>th</sup> General Meeting of the American Society for Microbiology**. Las Vegas, NV, U.S.A. May 23-27, 1994. Carbamylphosphate synthetase from a new hyperthermophilic archaeobacterium, *Pyrococcus abyssi*; C. Purcarea, G. Herve. *Poster*.
23. **The Genes and Enzymes of Pyrimidine Biosynthesis Sixth Harden Satellite Meeting**, Glasgow, U.K. September 12-14, 1992. Characterization of aspartate transcarbamylase of a hyperthermophilic archaeobacterium coming from a deep-sea hydrothermal vent. C. Purcarea, G. Erauso, M. Ladjimi, D. Prieur, G. Herve. *Poster*.
24. **Thermophiles: Science and Technology International Conference**, Reykjavik, Islande, August 23-26, 1992. Characterization of aspartate transcarbamylase of a hyperthermophilic archaeobacterium coming from a deep-sea hydrothermal vent. C. Purcarea, G. Erauso, M. Ladjimi, D. Prieur, G. Herve. *Poster*.

#### CONFERINTE NATIONALE

1. **Sesiunea Stiintifica a Institutului de Biologie Bucuresti**, 10 decembrie 2009. (1) Carbamoil fosfat sintetaza din archaeonul intestinal *Methanobrevibacter smithii*: clonare si expresie. Elena Popa, Andreea Rusu, Medana Zamfir, Cristina Purcarea; (2) Carbamoil fosfat sintetaza din archaeonul uman *Methanobrevibacter smithii*: un potential intermediar in evolutia filogenetica a acestei clase de enzime. Elena Popa, Andreea Rusu, Cristina Purcarea; (3) Glutamin sintetaza din archaeonul intestinal uman *Methanobrevibacter smithii*, potentiala enzima cheie in combaterea obezitati. Andreea Rusu, Elena Popa, Cristina Purcarea. *Postere*
2. **Curs Postuniversitar de studii avansate „Complexitatea biologică sub aspect macro, micro, nano”**, Institutul de Biochimie Bucuresti, 8-10 iulie 2009. Sinteza carbamoilfosfatului la microorganismele hipertermofile. C. Purcarea. *Prezentare orala*.
3. **Institutul de Biochimie Bucuresti**, 29 mai 2009. "Carbamoil fosfat sintetaza din microorganismele hipertermofile". Conferentiar invitat.
4. **Curs Postuniversitar de studii avansate „Adaptarea la stres : conditie de supravietuire si/sau factor de biodiversitate”** Institutul de Biologie Bucuresti, 31 octombrie-2 noiembrie 2007. Adaptari moleculare la temperaturi inalte. C. Purcarea. *Prezentare orala*.

## GRANTURI SI BURSE INTERNATIONALE

### Director de proiect/ Cercetator principal

1. **Director de proiect**, Programul National PNII Proiecte complexe de cercetare exploratorie. Faza II-Lista de rezerve. "Noi structuri proteice ale suprafetei celulare din microorganisme extremofile implicate in adaptarea la conditii extreme : bio-suprafete functionalizate stabile cu potential bionanotehologic" (2009-2012)
2. **Director de proiect**, Programul National PNII *Proiecte de cercetare exploratorie*, "Rolul microbiotei archaeene in controlul obezitatii: enzyme ale metabolismului argininei si pirimidinelor la *Methanobrevibacter smithii* cu potential reglator al asimilarii gastrointestinale" (2009-2012)
3. **Director de proiect**. Programul National PNCDI II *Workshopuri exploratorii* "Microorganisme extremofile: adaptari moleculare cu potential bionanotehologic"(18-19 septembrie 2008)
4. **Director de proiect**. Programul National "Cercetare de Excelenta" (CEEX) al Ministerului Educatiei si Cercetarii pentru stimularea revenirii in tara a cercetatorilor. Disfunctia mitocondriala in boala Alzheimer. (contract nr. 1491 / 07.04.2006). 2006-2008.
5. **Cercetator principal**. National Science Foundation U.S.A. (grant MCB-9810325 extins). Mecanisme ale adaptarii moleculare la temperaturi extreme ale enzimelor sintezei de carbamoil fosfat in microorganisme hipertermofile. Wayne State University, Detroit, USA, 1998-2004.
6. **Director de proiect**. Federation of European Biochemical Societies (FEBS), Cloning and sequencing of carbamyl phosphate synthetase gene from *Pyrococcus abyssi*. Universitatea Vrije, Bruxelles, Belgia. 1995
7. **Director de proiect**. International Human Frontiers Science Program (HFSP), (SF-339/94), Cloning and sequencing of CPS gene from *Pyrococcus abyssi*. Universitatea Vrije, Bruxelles, Belgia. 1995
8. **Sef de proiect/cercetator principal**. Proiectului European de Cercetare EUREKA. Societatea de biotehnologie Avidis S.A. Clermont-Ferrand, Franta. Coordonarea stiintifica si manageriala a proiectului urmarind obtinerea de proteine umane apartinand principalelor clase de tinte terapeutice in industria biofarmaceutica si in identificare de noi medicamente (2002-2003).

### Partener grant

1. Responsabil Partener IBB. PNII Parteneriate in domenii prioritare "Procedeu biotehologic hibrid pentru epurarea apelor uzate cu continut ridicat de amoniu" (HIBROX). Coordonator INCD-ECOIND. (2008-2011)
2. Grant PNCDI2 al MEC. Noi programe capabile de sinteza enzimatica a unor biopolimeri terapeutici activi, utilizand glicerina (subprodus al obtinerii biodieselului) ca substrat. Contract nr. 2497. 2007-2010.
3. Grant CEEX al MEC. Biotehologii de realizare a produselor nutraceutice cu efecte in reglarea functiilor metabolice, Compania de Cercetari Aplicative si investitii S.A. (contract nr 2999/31.07.2006). 2006-2008.
4. Grant G.0040.96, Belgian (Flanders) Nationaal Fonds voor Wetenschappelijk Onderzoek. Clonarea si secventializarea genei codante a aspartat transcarbamilazei din archaeobacteria hipertermofila si barofila *Pyrococcus abyssi*, Universitatea Vrije, Bruxelles, Belgia, 1995-1996.
5. Grant 1-96-3-21-145-0 Onderzoeksraad (OZR), Studiul aspartat transcarbamilazei recombinante din archaeobacteria hipertermofila si barofila *Pyrococcus abyssi*. Universitatea Vrije, Bruxelles, Belgia, 1995-1996.

### Burse de studii si cercetare

1. Bursa Guvernului Francez pentru *Masters (Diplôme d'Etudes Approfondies)*. Universitatea Paris XI, Paris, Franta. Identificarea aspartat transcarbamilazei dintr-o archaeobacterie termofila extrema care traieste presiune hidrostatica ridicata intr-o sursa hidrotermala marina. (1990-1991)
2. Bursa Guvernului Francez pentru *Doctorat*. Studiul enzimelor implicate in metabolismul carbamil fosfatului la archaeobacteria marina hipertermofilă și barofilă *Pyrococcus abyssi*". Universitatea Paris XI, Paris, Franta 1991-1994.

## ACTIVITATI STIINTIFICE SUPLIMENTARE

**Conducator de doctorat** in cadrul Academiei Romane, domeniul Biologie

**Referent** pentru recenzia de articole stiintifice in urmatoarele jurnale de specialitate: Journal of Biological Chemistry, Biochemistry, Protein Science si Archaea

**Membre in comisia de doctorat**

Referent in comisia pentru sustinerea lucrarii de doctorat a DI. KHAN Shakil, Universitatea Vrije, Bruxelles, Belgia, Ianuarie 2002.

**Instruirea si coordonarea** unor studenti predoctorali (stagii: D. Ebert, I. Kotchis) si doctorali (A. Ahuja, B. Fan, M Liu) in laboratorarele de la universitatile Vrije din Belgia (1995-1996) si Wayne State din SUA (1997-2001 si 2003-2005).

### **REZULTATE SEMNIFICATIVE**

1. Clonarea si caracterizarea structurala a primei aspartat transcarbamoilaze (ATC) archaeene.
2. Descoperirea si caracterizarea unui nou tip enzimatic al carbamoilfosfat sintetazelor (CPS) in *P. abyssi*, cu proprietati comune CPS-CK (carbamat kinaza), reprezentand o etapa intermediara in evolutia acestor enzime.
3. Evidentierea si caracterizarea mecanismului de transfer direct (channeling) al carbamoilfosfatului in reactiile cuplate ale CPS in microorganismele hipertermofile *P. abyssi* si *Aquifex aeolicus*.
4. Clonarea si caracterizarea functionala a aspartat transcarbamilazei (ATC) din *A. aeolicus*, enzima cheie a sintezei pirimidinice.
5. Izolarea si caracterizarea structurala si functionala a CPS din *A. aeolicus*, enzima model pentru elucidarea mecanismului de reactie a carbamoilfosfat sintetazelor.
6. Studiul mecanismului de reactie al carbamoilfosfat sintetazei din eubacteria *A. aeolicus*.
7. Clonarea si caracterizarea structurala si functionala a dihidrooorotaza (DHO) din *A. aeolicus*.
8. Cristalizare si identificarea structurii 3-D prin cristalografie de raze X a DHO din *A. aeolicus*, reprezentand prima structura cristalografica din aceasta clasa de enzyme.
9. Reconstituirea unui complex multienzimatic de tip uman al enzimelor care catalizeaza primele 3 reactii din sinteza pirimidinelor plecand de la componentele bacteriene.
10. Studiul Ser/Thr protein kinazei din *A. Aeolicus*: cel mai primitiv sistem de reglare metabolica identificat.
11. Identificarea archaeobacteriilor metanotrofe si metonogene in ecosistemele izolate din peștera Movile din Romania.
12. Proiectului european EUREKA pe care l-am condus in compania AVIDIS S.A. in calitate de *Sef de proiect* a constat in producerea de proteine umane in scop terapeutic pentru industria biofarmaceutica (2002-2003). Acesta a constat in clonarea, exprimarea, replierea si caracterizarea proteinelor recombinante umane serin/treonin kinaza Aik1, trombina, GPCR, interleukina-7.

### **PREMII SI DISTINCTII**

- *Sef de promotie Facultatea de Biochimie, Institutul Politehnic Bucuresti. 1988.*
- Doctorat in enzimologie (echivalat Doctorat in Biologie), *calificativ maxim « Très honorable avec félicitations du jury ».* Universitatea Paris XI, 1995.
- *Pret Salavin Travel Grant, 16<sup>th</sup> International Congress of Biochemistry and Molecular Biology, New Delhi, India. 1994*
- *ASM Travel Grant, 94<sup>th</sup> General Meeting of the ASM, Las Vegas, USA. 1994*

### **MEMBRU AL SOCIETATILOR STIINTIFICE**

- Societatea Romana de Microbiologie (2009)
- American Society for Microbiology (ASM), U.S.A. (1993-1996)
- Société Française de Biochimie et Biologie Moléculaire (SFBBM), Franta (1992-1996)
- Groupe de Recherche "BACTOCEAN", Franta (1991-1993)